



State of Utah

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## ADDENDUM #2

Date: 19 July 2006

To: Contractors

From: Jim Russell, Project Manager, DFCM

Reference: UDOT Region 3 Fire System Upgrades  
DFCM Project No. 05233900

Subject: **Addendum No. 2**

Addendum 2	1 page
Engineers Addendum	3 pages
Specification Section 13851	13 pages
Specification Section 13830	10 pages
<u>Revised Drawings</u>	<u>10 pages</u>
<b>Total</b>	<b>37 pages</b>

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**Note:** *This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.*

End of Addendum



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**Date:** July 19, 2006

**To:** Jim Russell  
State of Utah DFCM

**From:** Greg Jones  
Protection Consultants, Inc.

**Project:** UDOT Region 3 – DFCM 05233900

**Subject:** Revisions to Fire Protection Drawings and Specifications for Addendum 2

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Based on questions presented and conditions observed in the pre-bid walkthrough held Tuesday July 11, 2006 at UDOT Region 3, several revisions were made to the contract documents. A detailed description of the revisions made to each sheet and each specification section is included below. The drawing revisions should be issued to each bidding contractor with Addendum 2. This letter should be included with the addendum to assist the contractor to rapidly identify the revisions to the contract documents.

**Sheet FP-1.1:** No Revisions

**Sheet FP-2.1:**

1. Edited key note 2 to indicate that contractor must coordinate with locations of existing buried utilities. Existing buried utilities to be marked by owner.

**Sheet FP-2.2:** No Revisions

**Sheet FP-2.3:**

1. Edited key note 2 to indicate that contractor must coordinate with locations of existing buried utilities. Existing buried utilities to be marked by owner.
2. Edited drawing to show size of existing exterior canopy at south end of building.
3. Edited key note 4 to require the use of antifreeze filled piping (with antifreeze loop) for fire sprinkler protecting exterior canopy at south end of building.

**Sheet FP-2.4:**

1. Edited key note 2 to indicate that contractor must coordinate with locations of existing buried utilities. Existing buried utilities to be marked by owner.
2. Edited drawing to show size of existing exterior canopy over Waste Oil.
3. Added key note 4 to indicate that fire sprinkler protection is required for exterior canopy over Waste Oil.

**Sheet FP-2.5:**

1. Edited key note 2 to indicate that contractor must coordinate with locations of existing buried utilities. Existing buried utilities to be marked by owner.
2. Revised design density legend and design density plan in portion of Electric Shop to require a discharge density of 0.495 gpm/sq ft to protect the existing high piled storage present in that area.

**Sheet FP-3.1:**

1. Relocated annunciator panel from glass wall at entry to sheet rock wall adjacent to elevator.
2. Indicated existing door hold-open device on door at elevator lobby and added key note 9 to specify connection of existing door hold-open device to new fire alarm system.
3. Relocated FACP to Kitchen/Break room and revised key note 1 to require FACP to be installed recessed into wall.
4. Relocated control modules, heat and smoke detectors for elevator recall from 2<sup>nd</sup> floor to elevator equipment room on 1<sup>st</sup> level.
5. Edited key note 4 to require waterproof cable in buried conduits between buildings.
6. Edited general note 7 to allow the use of flexible conduit and metallic clad (MC) cable.
7. Added general note 14 to require demolition/removal of existing system that provides elevator recall and actuation of fire/smoke dampers.

**Sheet FP-3.2:**

1. Indicated existing door hold-open device on door at elevator lobby and added key note 9 to specify connection of existing door hold-open device to new fire alarm system.
2. Relocated control modules, heat and smoke detectors for elevator recall from 2<sup>nd</sup> floor to elevator equipment room on 1<sup>st</sup> level.
3. Edited general note 7 to allow the use of flexible conduit and metallic clad (MC) cable.
4. Added general note 14 to require demolition/removal of existing system that provides elevator recall and actuation of fire/smoke dampers.

**Sheet FP-3.3:**

1. Edited key note 5 to allow flexibility in the location of the remote notification circuit power supplies.
2. Edited key note 4 to require waterproof cable in buried conduits between buildings.
3. Edited general note 7 to allow the use of flexible conduit and metallic clad (MC) cable.

**Sheet FP-3.4:**

1. Edited key note 5 to allow flexibility in the location of the remote notification circuit power supplies.
2. Edited key note 4 to require waterproof cable in buried conduits between buildings.
3. Edited general note 7 to allow the use of flexible conduit and metallic clad (MC) cable.

**Sheet FP-3.5:**

1. Edited key note 5 to allow flexibility in the location of the remote notification circuit power supplies.
2. Edited key note 4 to require waterproof cable in buried conduits between buildings.
3. Edited general note 7 to allow the use of flexible conduit and metallic clad (MC) cable.

**Sheet FP-3.6:**

1. Edited single line fire alarm riser diagram to show addition of door holders and relocation of elevator recall/power shunt trip detectors and control modules in accordance with revisions made to sheets FP-3.1 and FP-3.2.
2. Edited general note 7 to allow the use of flexible conduit and metallic clad (MC) cable.

**Specification Section 13851:**

1. Added paragraph 1.4-A-6 to require submittal of equipment data sheets for conduit and cable.
2. Edited paragraph 1.5-C to require all cables installed in buried conduit to be waterproof.
3. Added paragraph 1.5-E-5 to require connection of existing door hold-open devices to new fire alarm system.
4. Edited paragraphs 1.6-C and 2.2-A-8 to allow 1/2" conduit and to allow the use of flexible conduit and metallic clad (MC) cable.
5. Edited paragraph 2.2-A-6 to allow the use of 1/2" conduit.

**Specification Section 13930:**

1. Added paragraph 1.8-A-4-e to specify 0.495 gpm/sq ft fire sprinkler design density to protect high piled storage area in Electrical Shop of Warehouse/Shop building.

## SECTION 13851 - FIRE ALARM SYSTEM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this section.

#### 1.2 DESCRIPTION OF WORK

- A. This section of the specifications includes the installation of a fire alarm system for the Administration, Materials Laboratory, Heavy Equipment/Paint Storage and Warehouse/Shop buildings at the UDOT Region 3 complex in Orem, UT. Fire alarm system shall include, but not be limited to, installation of addressable FACP in Administration building, installation of alarm initiating devices in all buildings, installation of a signaling line circuit from FACP to initiating devices using existing buried conduits between buildings provided by owner, installation of new alarm notification appliances, notification appliance circuits and power supplies, installation of auxiliary control devices and relays and wiring as shown on the drawings and specified herein.

#### 1.3 QUALITY ASSURANCE

- A. The fire alarm system shall comply with requirements of NFPA 72 (National Fire Alarm Code) for Local Protected Premises Signaling Systems except as modified and supplemented by this specification.
- B. All initiating devices shall be listed compatible with the control equipment used.
- C. Materials, devices and equipment shall be Underwriters Laboratories (UL) listed or Factory Mutual approved for use in fire alarm systems and shall comply with all applicable requirements of the following UL standards:
  - 1. UL 38 Manually Actuated Signaling Boxes
  - 2. UL 50 Cabinets and Boxes
  - 3. UL 864 Control Units for Fire Protective Signaling Systems
  - 4. UL 268 Smoke Detectors for Fire Protective Signaling Systems
  - 5. UL 464 Audible Signaling Appliances
  - 6. UL 521 Heat Detectors for Fire Protective Signaling Systems
  - 7. UL 1971 Visual Notification Appliances
- D. Shop drawings shall be prepared by an engineering technician or senior engineering technician (Level III or Level IV) NICET certified for fire alarm design. Include NICET certification number on the drawings. Drawings will be signed by the technician and submitted for approval under his name.
- E. Fire alarm contractor shall be licensed as a fire alarm contractor in the State of Utah. License shall be active throughout the duration of the project.

- F. Major system components (control panels, initiating devices, addressable modules or relays, etc.) shall be manufactured by a State of Utah DFCM approved manufacturer
- G. State of Utah DFCM Approved Manufacturers:
  - 1. Fire-Lite
  - 2. Silent Knight

#### 1.4 SUBMITTALS

- A. Descriptive Data: Descriptive data shall be submitted on the following items of material and/or equipment. Such data shall consist of manufacturer's or supplier's catalog information in sufficient detail to allow verification that the material and/or equipment meets the specification requirements, or is equal to that specified.
  - 1. Fire alarm control panel.
  - 2. Annunciator panel
  - 3. Initiating devices (smoke detectors, heat detectors, manual pull stations, monitor modules etc.)
  - 4. Relay modules to control protected premise fire safety functions.
  - 5. Notification appliances
  - 6. Conduit and cable
- B. Shop Drawings: Prior to ordering or installing any equipment, contractor shall prepare shop drawings for submittal to Owner/Engineer. Shop drawings shall include sufficient information, clearly presented, to determine compliance with drawings and specifications. Include manufacturer's name(s), model numbers, ratings, power requirements, equipment layout, device arrangement, complete wiring point-to-point diagrams, and conduit layouts.
- C. Submit four sets of drawings, descriptive data, battery calculations and voltage drop calculations to the Owner/Engineer for review. After review and acceptance by the Owner/Engineer, submit to State Fire Marshal for review. Any review comments, and associated drawing revisions, from state or local approving authorities that affect the system design shall be approved by the Owner/Engineer prior to installation.
- D. Testing Documentations/Certificates: Upon completion of installation submit to Engineer two copies of all material and test certificates.
- E. As-Built Drawings: A complete set of reproducible "as-built" drawings showing device addresses, installed wiring, color coding, and wire tag notations for exact locations of all installed equipment, specific interconnections between all equipment, and internal wiring of the equipment shall be delivered to the owner upon completion of system.
- F. O&M Manuals: Operating and instruction manuals shall be submitted prior to testing of the system. Three (3) complete sets of operating and instruction manuals shall be delivered to the owner upon completion. User operating instructions shall be provided prominently displayed on a separate sheet located next to the control unit in accordance with U.L. Standard 864. Include a CD with all FACP programming information with the O&M Manuals.

#### 1.5 SYSTEM DESCRIPTION

- A. Contractor shall furnish and install a single addressable FACP for entire building complex in Administration Building where indicated on the plans. FACP shall be Silent Knight model 5820XL or Fire-Lite MS-9600 with DACT-UD. FACP shall have integrated signaling line circuits (SLC) with sufficient capacity for all initiating devices and control modules required with an additional reserve of 20% unused addresses for future expansion. Provide telephone circuits to integrated DACT of control panel for off-premise monitoring, signaling line circuits, initiating device circuits, notification appliance circuits and power supplies in order to provide a complete fire alarm system in accordance with NFPA 72 and the drawings.
- B. Install fire alarm annunciator (key pad with alphanumeric readout) at main entrance of Administration building.
- C. Signaling line circuits: Provide signaling line circuit from addressable FACP to all initiating devices in each building. SLC circuit between building shall be placed in existing buried conduit provided by owner. Provide transient voltage surge suppression in accordance with NFPA 70 where circuit enters and/or exits a building. Total length of SLC shall not exceed recommendations of fire alarm panel manufacturer. Cable installed in buried conduits shall be suitable for installation submerged in water. Provide SLC circuit signal boosters or additional SLC circuits as required. SLC shall conform to requirements for Class A Style 6. Initiating devices include the following:
  - 1. Smoke detectors: Provide addressable smoke detectors in all corridors, lobbies, elevator equipment room and above all fire alarm control equipment.
  - 2. Heat detectors: Provide addressable heat detectors in elevator equipment room and bottom of elevator shaft as indicated on plans. Install heat detectors adjacent to fire sprinklers and provide relay and shunt trip breaker to disconnect power to electrical equipment upon activation of either heat detector.
  - 3. Manual pull stations: Install manual fire alarm pull stations at each building exit as indicated on drawings. Mount pull stations at 48" above the floor on recessed type junction boxes with conduit concealed in wall.
  - 4. Addressable monitor modules: Furnish and install modules to facilitate monitoring of existing conventional water flow switches and valve tamper switches.
- D. Notification Appliances/Circuits: Provide audible and visible notification throughout each building as indicated on drawings.
  - 1. Notification circuits in Administration Building shall be controlled and powered by FACP.
  - 2. Provide a remote notification circuit power supply in the Material laboratory, Heavy Equipment/Paint Storage and Warehouse/Shop buildings to control and provide power to notification appliance circuits in those buildings.
  - 3. Provide programmable control relay at each notification power supply to provide activation of notification appliance circuits.
  - 4. Notification circuits in each building shall be zoned such that appliance operate upon activation of fire alarm initiating device in that building only.
- E. Provide relay modules as indicated on the project drawings and specified below to provide the following protected premise fire safety functions. The number and location for relays shall be determined by contractor:
  - 1. Activation of notification appliances.
  - 2. Elevator recall
  - 3. Elevator power disconnect
  - 4. Fire/smoke damper closure
  - 5. Fire door release at elevator lobbies

- F. Contractor shall provide new power circuit to fire alarm control panel and remote notification circuit power supplies. New power circuit shall conform to all applicable requirements of NFPA 70 and 72.

## 1.6 SYSTEM DESIGN

### A. Basic Performance:

- 1. Initiating Device Circuits (IDC) shall be new and shall be wired Class A Style D.
- 2. Notification appliance circuits (NAC) shall be wired Class A Style Z.
- 3. Signaling line circuit (SLC) shall be wired Class A Style 6 or 7.
- 4. All circuits shall be power-limited, per 1995 UL864 requirements.
- 5. Single ground fault or open circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.
- 6. Alarm signals arriving at the main FACP shall not be lost following a primary power failure or outage of any kind until the alarm signal is processed and recorded.

### B. Basic System Functional Operation: When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:

- 1. The system Alarm LED at the FACP corresponding to the zone in alarm shall be illuminated.
- 2. A local sounder with the control panel shall sound.
- 3. LCD display on the FACP and remote annunciator shall indicate device address and description of device in alarm including its location within the protected premises.
- 4. In response to a fire alarm condition, the system will process all control programming and activate all system outputs (alarm notification appliances and/or relays) associated with the point in alarm.
- 5. Alarm signal shall be transmitted off-premise via the DACT to the central monitoring station selected by the owner.

### C. All wiring shall be free of opens, shorts and grounds. All wiring shall be installed in minimum 1/2" rigid or flexible conduit, red painted metallic clad (MC) cable or EMT. All penetrations through rated partitions shall be fire stopped with a suitable caulking compound. All wiring (except new power distribution circuits) shall be fire power limited (FPL) with minimum 300V insulation or equivalent complying with NFPA 70 Article 760.

### D. Provide a ground fault detection circuit, to detect positive and negative grounds on all field wiring. The ground fault detector shall operate the general trouble devices as specified but shall not cause an alarm to be sounded. Ground fault will not interfere with the normal operation, such as alarm, or other trouble conditions.

### E. All low voltage circuits will be protected by microprocessor controlled power limiting or have self restoring polyswitches for the following: smoke detector power, main power supply, indicating appliance circuits, battery standby power and auxiliary output.

### F. Notification circuits shall be designed to limit the voltage drop to a maximum of 20% from the power supply to the most remote device on any notification circuit.

### G. All visible alarms within a single field of view shall flash in synchronization.

### H. Secondary power supply (battery backup) shall be sufficient to provide a minimum of 24 hours of standby power with an additional reserve to operate the system for 5 minutes in alarm.



## 1.7 WARRANTY

- A. The contractor shall warrant all new equipment and wiring free from inherent mechanical and electrical defects for one year (365 days) from the date of final acceptance.

## 1.8 APPLICABLE CODES AND STANDARDS

- A. The specifications and standards listed below form a part of this specification. The system shall fully comply with all applicable provisions of the latest issue of these standards.
  - 1. International Building Code – 2003 edition
  - 2. International Fire Code – 2003 edition
  - 3. International Mechanical Code – 2003 edition
  - 4. Utah State Fire Marshal Rule R710-4
  - 5. NFPA 70 - National Electrical Code – 2002 edition
  - 6. NFPA 72 - National Fire Alarm Code – 2002 edition
  - 7. NFPA 101 Life Safety Code – 2003 edition

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. All new equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.
- B. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place. Fasteners and supports shall be adequate to support the required load.

### 2.2 CONDUIT AND WIRE

- A. Conduit
  - 1. Conduit shall be in accordance with The National Electrical Code (NEC), local and DFCM requirements.
  - 2. Conduit fill shall not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.
  - 3. Cable must be separated from any open conductors of Power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.
  - 4. Wiring for 24 volt control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
  - 5. Conduit shall not enter the fire alarm control panel, or any other remotely mounted control panel equipment or backboxes, except where conduit entry is specified by the equipment manufacturer.
  - 6. Conduit shall be 1/2 inch minimum.

7. Install conduit attached to structure by straps, staples, hangers or similar fittings designed and installed to support conduit. Installation shall conform to NFPA 70 Article 760 and 300.4.
8. Conduit shall be rigid, flexible or EMT. Red painted metallic clad (MC) cable may be used.
9. Where wiring is installed concealed above the ceiling or in truss space conduit is not required.
10. Conduit and junction boxes used for the fire alarm system shall be marked and labeled to indicate that they are part of the building fire alarm system. Conduits shall be periodically marked with red paint and labeled to indicate the circuit type and designation contained inside. Junction boxes shall be painted red.

B. Wire

1. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for initiating device circuits and 14 AWG (1.63 mm) for notification appliance circuits.
2. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
3. The system shall permit the use of IDC and NAC wiring in the same conduit or raceway.
4. All field wiring shall be completely supervised. In the event of a primary power failure, disconnected standby battery, removal of any internal modules, or any open circuits in the field wiring; a trouble signal will be activated until the system and its associated field wiring are restored to normal condition.
5. Terminal Boxes, Junction Boxes and Cabinets: All boxes and cabinets shall be UL listed for their use and purpose.
6. The fire alarm control panel and remote notification circuit power supplies shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the power distribution panel as FIRE ALARM. Fire alarm control panel primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod.

2.3 FIRE ALARM CONTROL PANEL

- A. FACP shall be either Silent Knight model 5820 XL or Fire-Lite MS-9600 with DACT-UD.
- B. The FACP must have Drift Compensation sensitivity capabilities on detectors and be capable of supporting a minimum of 127 addressable points. The communication protocol on the SLC loop must be digital.
- C. The FACP must have a built in UL approved digital communicator. The communicator must allow local and remote up/downloading of system operating options, event history, and detector sensitivity data. The FACP must automatically test the smoke detectors in compliance with NFPA standards to ensure that they are within listed sensitivity parameters and be listed with Underwriters Laboratories for this purpose.
- D. The FACP must compensate for the accumulation of contaminants that affect detector sensitivity. Maintenance alert feature (differentiated from trouble condition), detector sensitivity selection, auto-programming mode (Jumpstart) and the ability to upgrade the core operating software on site or over the telephone.

- E. The main communication bus shall be capable of class A or class B configuration with a total Bus length of not less than 6,000 feet.
- F. The main control must have a built in annunciator with a minimum 80 character LCD display and feature LED's for General alarm, Supervisory, System trouble, System silence and Power. When in the normal condition the LCD shall display time and date which is capable of automatic daylight savings time adjustments. The annunciator must be able to silence and reset alarms through the use of a keypad-entered code, or by using a firefighter key. The annunciator must have twenty levels of user codes that will allow the limitation of operating system programming to authorized individuals.
- G. Provide all necessary system expansion modules or equipment required to provide a complete and functional fire alarm system as described on the project drawings and specified herein.

2.4 NOT USED

2.5 ANNUNCIATOR PANEL

- A. Furnish and install new remote annunciator panel for the FACP where shown on the drawings. Wall mount remote annunciator at 54" AFF. Install annunciator on recessed junction box with conduit concealed in wall.
- B. LCD Remote annunciator shall have the same control and display layout so that it matches identically the built in annunciator on the FACP. LED Remote annunciator shall have individually mapped LED's and reset and silence inputs. Remote annunciator shall be capable of operating at a distance of 6000 feet from the main control panel on unshielded non-twisted cable.

2.6 DACT

- A. The digital communicator must be an integral part of the control panel and be capable of reporting all zones or points of alarm, supervisory, and trouble as well as all system status information such as loss of AC, low battery, ground fault, loss of supervision to any remote devices with individual and distinct messages to a central station or remote station. The communicator must also be capable of up/downloading of all system programming options, Event history and Sensitivity compliance information to a PC on site or at a remote location. The communicator shall have an answering machine bypass feature that will allow the panel to respond to communication even on phone lines that have other communication equipment present. The communicator must be capable of reporting via SIA and Contact ID formats. The communicator shall have a delayed AC loss report function which will provide a programmable report delay plus a 10-25 min random component to help ease traffic to the central station during a power outage.

2.7 SLC CIRCUITS

- A. Each SLC shall be capable of a wiring distance of 10,000 feet from the SLC driver module and be capable of supporting at least 100 devices. The communication protocol to SLC devices must be digital. Any SLC loop device, which goes into alarm, must interrupt the polling cycle for priority response from the FACP. The FACP must respond consistently to a device that goes

into alarm on an SLC in under 3 seconds. The SLC shall be capable of functioning in a class A or class B configuration.

## 2.8 SLC LOOP DEVICES

- A. Devices supported must include analog photoelectric smoke detectors, manual pull stations, heat detectors, contact monitoring modules and relay output modules. There is to be no limit to the number of any particular device type that can be connected to the SLC.

## 2.9 ADDRESSABLE SYSTEM DEVICES – GENERAL

- A. Addressable devices shall provide an address-setting means using rotary decimal switches.
  - 1. Addressable devices shall use simple to install and maintain address switches.
  - 2. Detectors shall be Analog and Addressable, and shall connect to the fire alarm control panel's Signaling Line Circuits.
  - 3. Addressable smoke and thermal detectors shall provide dual (2) status LEDs. Both LEDs shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDs shall be placed into steady illumination by the control panel, indicating that an alarm condition has been detected.
  - 4. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter 7.
  - 5. The detectors shall be ceiling-mount and shall include a separate twist-lock base which includes a tamper proof feature.
  - 6. The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel.
  - 7. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (ION, PHOTO, THERMAL)

## 2.10 PHOTOELECTRIC SMOKE DETECTOR

- A. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density. Detector shall incorporate visible LEDs that flashes to indicate normal function and is continuously illuminated to indicate alarm condition

## 2.11 THERMAL DETECTORS

- A. New thermal detectors shall be intelligent addressable devices rated at 135 degrees Fahrenheit (58 degrees Celsius) fixed temperature element and rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute. Both shall mount to a base that is connect via two wires to the fire alarm control panel signaling line circuit

## 2.12 NOT USED

## 2.13 ADDRESSABLE DRY CONTACT MONITOR MODULE

- A. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any N.O. dry contact device) to one of the fire alarm control panel SLC loops.
- B. The monitor module shall mount in a 4-inch square, 2-1/8 inch deep electrical box.
- C. The IDC zone shall be suitable for Class A Style D operation. An LED shall be provided (visible outside junction box) that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel

#### 2.14 ADDRESSABLE CONTROL MODULE

- A. Addressable control modules shall be provided to supervise and control the operation of one conventional NACs of compatible, 24 VDC powered, polarized audio/visual notification appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contract relay.
- B. The control module shall mount in a standard 4-inch square, 2-1/8 inch deep electrical box, or to a surface mounted backbox.
- C. The control module NAC may be wired for Style Z (Class A) with up to 1 amp of inductive A/V signal, or 2 amps of resistive A/V signal operation, or as a dry contact (Form-C) relay. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.
- D. Audio/visual power shall be provided by a separate supervised power loop from the main fire alarm control panel or from a supervised, UL listed remote power supply.
- E. The control module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC.

#### 2.15 MANUAL PULL STATIONS

- A. Manual fire alarm stations shall be non-coded, single or double action type, with a key operated test reset lock in order that they may be tested, and so designed that after actual emergency operation, they cannot be restored to normal except by use of a key. The reset key shall be so designed that it will reset the manual Pull Station and open the FACP cabinet without use of another key. An operated station shall automatically condition itself so as to visually detected, as operated, at a minimum distance of fifty feet, front or side. Manual stations shall be constructed of die cast metal with clearly visible operating instructions on the front of the station in raised letters. Stations shall be suitable for surface mounting on matching back box, or semi-flush mounting on a standard single gang box, and shall be installed within the limits defined by the Americans with Disabilities Act (ADA) dependent on Manual Station accessibility or per local requirements.

#### 2.16 BATTERIES AND CHARGER

- A. Battery
  - 1. Shall be 12 volt, Gell-Cell type.

2. Battery shall have sufficient capacity to power the fire alarm system for not less than 24 hours plus 5 minutes of alarm upon a normal AC power failure.
3. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks refilling, spills and leakage shall not be required.

B. Battery Charger

1. Shall be completely automatic, with constant potential charger maintaining the battery fully charged under all service conditions. Charger shall operate from a 120-volt 60 hertz source.
2. Shall be rated for fully charging a completely discharged battery within 48 hours while simultaneously supplying any loads connected to the battery.
3. Shall have protection to prevent discharge through the charger.
4. Shall have protection for overloads and short circuits on both AC and DC sides.

2.17 ENCLOSURES

- A. The control panels shall be housed in a UL listed cabinet suitable for surface or semi-flush mounting. Cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.
- B. The back box and door shall be constructed of 0.060 steel with provisions for electrical conduit connections into the sides and top:
- C. The door shall provide a key lock and shall include a glass or other transparent opening for viewing of all indicators.
- D. The control unit shall be modular in structure for ease of installation, maintenance, and future expansion.

2.18 NOTIFICATION APPLIANCES

- A. Visible and audible/visible signals shall be listed by Underwriters Laboratories Inc. per UL 1971 and/or 1638.
- B. Each indicating appliance circuit shall be electrically supervised for opens, grounds and short circuit faults, on the circuit wiring, and shall be so arranged that a fault condition on any indicating appliance circuit or group of circuits will not cause an alarm to sound. The occurrence of any fault will light the trouble LED and sound the system trouble sounder, but will not interfere with the proper operation of any circuit which does not have a fault condition.
- C. The notification appliance (combination audible/visible units only) shall produce a peak sound output of 90dba or greater as measured in an anechoic chamber. The visible signaling appliance shall maintain a minimum flash rate of 1Hz or greater regardless of power input voltage. The appliance shall also be capable of meeting the candela requirements of the blueprints presented by the Engineer and ADA. The appliance shall be capable of synchronization with all other appliances in the same field of view.
- D. The appliance shall be polarized to allow for electrical supervision of the system wiring.
- E. The unit shall be provided with terminals with barriers for input/output wiring and be able to mount a single gang or double gang box or double workbox with the use of an adapter plate.

- F. The unit shall have an input voltage range of 20-30 volts with either direct current or full wave rectified power.

#### 2.19 SPARE DEVICES

- A. Furnish the owner with a stock of spare initiating devices and notification appliances to allow for future addition/relocation of devices or replacement of equipment that fails after expiration of the warrantee period. Manufacturer and model number of spare devices shall match those of devices used for the system installation. Minimum number and type of devices per building shall be as indicated below:
  - 1. Three smoke detectors.
  - 2. One heat detector.
  - 3. Two manual pull stations.
  - 4. Six notification appliances corresponding to the type and proportion of notification appliances installed.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Contractor shall be responsible to attend a mandatory pre-bid walk through of the building. If required, an additional pre-bid inspection can be arranged. The contractor shall be responsible to examine all areas and conditions under which fire alarm systems are to be installed and identify conditions detrimental to proper completion of the work. All unsatisfactory conditions shall be specifically identified in the bid.

#### 3.2 INSTALLATION

- A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.
- B. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas.
- C. All fire detection and alarm system devices, control panels and remote annunciator (unless otherwise noted on drawings) shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.
- D. Contractor is responsible for making his own job check and any necessary adjustments in the design prior to installation. Make final coordination with existing building elements and adjust design as necessary. Major conflicts shall be brought to the attention of the Project Engineer for resolution.

#### 3.3 FIELD QUALITY CONTROL

- A. Obtain permits and post bonds as required by state and local AHJ's (Authorities Having Jurisdiction).

- B. Inform AHJ's of job progress. Request presence of AHJ's, perform tests, and document results using Contractor's Material and Test Certificates.

### 3.4 TESTING/TRAINING

- A. Make and pay for all tests required by applicable codes during and after completion of the work and correct and defects in the systems indicated by the tests.
- B. The service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment shall be provided to technically supervise and participate during all of the adjustments and tests for the system.
- C. Testing shall include but not be limited to the following:
  - 1. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
  - 2. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP.
  - 3. Verify activation of all flow switches.
  - 4. Open initiating device circuits and verify that the trouble signal actuates.
  - 5. Open and short notification appliance circuits and verify that trouble signal actuates.
  - 6. Ground initiating device circuits and verify response of trouble signals.
  - 7. Ground notification appliance circuits and verify response of trouble signals.
  - 8. Check all alarm notification devices for proper function.
  - 9. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.
  - 10. Test system batteries to verify that secondary power supply is sufficient to provide specified standby and alarm power.
- D. Train the Owner's maintenance personnel in the proper operation, testing and maintenance of all installed equipment. Training shall be sufficient to enable owner to service equipment, add or remove devices and make programming changes.

### 3.5 FINAL INSPECTION

- A. At the final inspection, a factory-trained representative of the manufacturer of the major equipment shall demonstrate that the system functions properly in every respect.

### 3.6 INSTRUCTION

- A. Instruction shall be required for operating the system. Hands-on demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.
- B. The contractor and/or the systems manufacturer's representatives shall provide a typewritten "Sequence of Operation."

### 3.7 CLEANING



- A. Remove dust, scale, debris, and foreign substances from interior and exterior of devices, equipment, and materials prior to installation.
- B. Upon job completion, remove tools, surplus materials and equipment, leaving all areas broom clean.

### 3.8 AUTHORITIES HAVING JURISDICTION

- A. of installation is subject to final inspection and approval by:
  - 1. State of Utah Fire Marshal's Office
  - 2. State of Utah Division of Facilities and Construction Management
  - 3. Building Maintenance Personnel
  - 4. Project Engineer.

END OF SECTION 13851

## SECTION 13930 - FIRE SPRINKLER SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract apply to this section.
- B. Technical sections which describe related work such as Section 13851 relate to this section.

#### 1.2 SUMMARY

- A. Furnish all materials, equipment and supplies and perform all work and operations to design, construct and make functional fire sprinkler systems to protect all portions of the existing Administration, Laboratory, Heavy Equipment/Paint Storage and Warehouse/Shop buildings at the UDOT Region 3 complex in Orem, UT. The design shall meet the requirements of NFPA 13 and be in accordance with the bid drawings and specifications. Reference to other specifications, codes, standards or manuals which are a part of these specifications, but are not included herein, shall be the latest adopted edition of these publications.

#### 1.3 QUALITY ASSURANCE

- A. Materials, devices and equipment shall be Underwriters Laboratories listed and/or Factory Mutual approved for use in fire protection systems.
- B. Installer: The sub-contractor for the fire sprinkler system shall be duly licensed by the state of Utah. The sub-contractor must be engaged in the installation of the types of automatic fire sprinkler systems required for this project and be fully familiar with all local conditions, specified codes and requirements.
- C. Designer: The designer for the fire sprinkler system shall be a staff employee of the "Installer" and shall be a licensed engineer (Utah registration) with a minimum of 4 years experience in fire protection design or a Certified Engineering Technician in Fire Protection (NICET level III minimum). The Certification shall be active during the entire contract period. The designer shall certify that the drawings and installation are in accordance with all applicable provisions of NFPA 13, the plans and specifications. The designer shall make a complete and final inspection of the installation, including operating all alarms, control valves, checking all piping, seismic bracing, hangers, etc. After checking all components of the system, he shall provide a letter stating that the installation is complete, operational and in accordance with approved plans and specifications. If changes have been made in the installation since the plans were approved, the designer shall correct the shop drawings and provide as-built drawings to the Owner with the letter.

#### 1.4 SUBMITTALS

- A. Shop Drawings: The fire sprinkler contractor shall prepare complete shop drawings for each fire sprinkler system. Shop drawings shall be coordinated with structure and with all other trades. Show all piping, sprinklers, ceiling grid, lights, grilles, ducts, registers and diffusers, etc. Draw

sections to show relative elevations of piping, ductwork, conduit, cable trays, ceiling grid, beams, etc. Show heads symmetrically related to ceiling patterns and show sprinklers centered ( $\pm 2"$ ) in tiles in grid. The shop drawings shall contain, as a minimum, the information outlined and listed in NFPA 13 chapter 14. Submit fire sprinkler drawings and hydraulic calculations to each Authority Having Jurisdiction for review prior to starting work. Final design shall incorporate all requirements of the AHJ's. Work only from reviewed documents. Submit shop drawings to the following:

1. Project Engineer.
  2. Utah State Fire Marshal's Office
- B. To facilitate preparation of shop drawings, contractor may request CAD files of building floor plans from DFCM CAD Services or Project Engineer. Plans of other building systems (i.e. reflected ceiling plans, lighting plans, structural framing plans, mechanical plans, etc.), that may be required to prepare shop drawings, are available in printed format (PDF) only.
- C. Hydraulic Calculations: Furnish complete hydraulic calculations for the hydraulically most remote area of each different occupancy classification of each system.
- D. Descriptive Data: Descriptive data shall be submitted on the following items of material and/or equipment. Such data shall consist of manufacturer's or supplier's catalog information in sufficient detail to allow verification that the material and/or equipment meets the specification requirements, or is equal to that specified.
1. Backflow preventer, valves, trim, pipe, fittings, couplings, sprinklers, valve tamper and water flow alarm devices.
- E. Submittal Procedure: Prior to ordering or fabricating equipment, prepare shop drawings for submittal to Engineer and Utah State Fire Marshal's Office. Submit four sets of drawings, equipment data sheets and calculations to each AHJ for review. Any review comments, and associated drawing revisions, from the Utah State Fire Marshal's review that affect the system design shall be approved by the Engineer prior to installation.
- F. Upon completion of installation submit to Engineer two copies each:
1. Contractor's Material & Test Certificate for Underground Piping.
  2. Contractor's Material & Test Certificate for Aboveground Piping.
  3. As-built shop drawings with designer's signature and certification number.
- 1.5 WORK INCLUDED
- A. Site Fire Protection Equipment:
1. Furnish and install a new underground fire sprinkler supply main from existing underground water line to fire sprinkler riser location in each building. See drawing FP-1.1 for size and location of each fire sprinkler lateral. Installation of each fire sprinkler lateral shall conform to all applicable requirements of NFPA 13, NFPA 24 and state and local codes. Fire sprinkler installer shall be licensed by the State of Utah to install underground fire sprinkler service mains.

- B. Wet-pipe fire sprinkler system per NFPA 13 to protect all areas of each building (Administration, Laboratory, Heavy Equipment/Paint Storage and Warehouse/Shop). Work includes but is not limited to:
  - 1. Design and installation drawings, including hydraulic calculations.
  - 2. Fire sprinkler riser including backflow preventer, 2" main drain, wall mounted fire department connection and water flow switch.
  - 3. Fire sprinkler pipe, fittings, hangers and sprinklers.
  - 4. Drain and test valves.
  - 5. Signs, spare sprinklers, earthquake bracing, sprinkler escutcheons, testing and documentation.

#### 1.6 RELATED WORK

- A. Painting.
- B. Excavation and Backfill.
- C. Electrical Materials and Methods.
- D. Fire Alarm and Detection.

#### 1.7 SYSTEM DESCRIPTION

- A. Furnish and install a new underground fire sprinkler supply main to fire sprinkler riser in each building from existing 8" underground water main that is located near the center of the site. Refer to drawing FP-1.1 for location, size and approximate length of each fire sprinkler lateral. Work includes but is not limited to:
  - 1. Install, flush and test all new underground piping in accordance with the requirements of NFPA 13 and NFPA 24.
    - a. Pipe shall be run with a minimum of bends, fittings, etc.
    - b. Minimum depth of pipe cover shall be 5 feet or per local ordinance, whichever is greater.
    - c. All changes in direction shall be secured against movement.
    - d. Flange X spigot piece shall be secured to the underground elbow with steel rods.
    - e. All rods, bolts and other ferrous parts shall be protected from corrosion.
- B. Design, furnish and install new wet-pipe fire sprinkler systems for each building (Administration, Laboratory, Heavy Equipment/Paint Storage and Warehouse/Shop) in accordance with NFPA 13 to provide fire protection of ALL areas of each existing building. Work includes but is not limited to the following:
  - 1. Each building shall be protected by an independent fire sprinkler system with a dedicated underground supply main and fire sprinkler riser. The location of the fire sprinkler riser for each building shall be as indicated on the drawings. Each riser shall incorporate a double check backflow preventer (Ames Colt Series C200BFG or equal), 2" main drain to exterior and vane type water flow switch. Fire sprinkler risers shall conform to the schematic details included on project drawings.
  - 2. Provide and install a 2-way x 2-1/2" wall mount FDC on the exterior wall of each building at the fire sprinkler riser. Mount FDC between 18" and 48" above exterior grade. Provide 1/2" automatic ball drip to facilitate drainage of FDC piping.

3. Provide fire sprinkler protection for all concealed spaces (unless otherwise noted) enclosed wholly or partly by exposed combustible construction or that contain exposed combustible materials.
4. Piping shall be concealed above ceilings where ceilings are present and may be run exposed in areas without ceilings. Where horizontal piping is exposed, the piping shall be run as high as possible.
5. Where practical, install piping to drain back to the fire sprinkler riser. Where piping cannot be pitched to drain to the riser, provide auxiliary drains per NFPA 13 to facilitate drainage of the fire sprinkler piping.
6. Provide extra sprinklers per NFPA 13 for protection below overhead doors, ducts, conduit or similar exposed obstructions over 48" wide. Provide extra sprinklers as required by NFPA 13 where sprinkler discharge is obstructed.
7. Water filled piping shall be installed in areas where the temperature will be reliably maintained at or above 40° F. Where piping must be installed in areas with temperatures below 40°F, fill piping with antifreeze solution and isolate antifreeze solution from water filled piping with a reduced pressure zone backflow preventer/expansion tank assembly as indicated in NFPA 13 Figure 7.5.3.2.
8. Provide UL approved through penetration fire-stop system where fire sprinkler piping passes through fire rated walls.

## 1.8 SYSTEM DESIGN

- A. Design densities and areas of application (see drawings sheets FP-2.1 through FP-2.5).
1. Administration Building:
    - a. Storage, Janitorial, Elevator Equipment (including shaft/pit) and Plan Room: Ordinary hazard group 2, 0.20 gpm/sq. ft over entire room with 250 gpm hose allowance.
    - b. Mechanical, Electrical and Computer/Telecom Equipment rooms: Ordinary hazard group 1, 0.15 gpm/sq. ft over entire room with 250 gpm hose allowance.
    - c. All other areas: Light hazard, 0.10 gpm/sq. ft over 1,500 sq. ft with 100 gpm hose allowance.
  2. Laboratory Building:
    - a. Lab Space 110, Vehicle Storage 118, Lab Space 117 and Janitorial 111: Ordinary hazard group 2, 0.20 gpm/sq. ft over 1,500 sq ft with 250 gpm hose allowance.
    - b. Mechanical/Electrical 114, Communications 115 and Moist Room 116: Ordinary hazard group 1, 0.15 gpm/sq. ft over entire room with 250 gpm hose allowance.
    - c. All other areas: Light hazard, 0.10 gpm/sq. ft over 1,500 sq. ft with 100 gpm hose allowance.
  3. Heavy Equipment/Paint Storage Building:
    - a. Storage, Vehicle Maintenance, Waste Oil and Welding Shop: Ordinary hazard group 2, 0.20 gpm/sq. ft over 1,500 sq ft with 250 gpm hose allowance.
    - b. Mechanical Room: Ordinary hazard group 1, 0.15 gpm/sq. ft over entire room with 250 gpm hose allowance.

- c. Office, Restrooms and Training Room: Light hazard, 0.10 gpm/sq. ft over entire room with 100 gpm hose allowance.
    - d. Paint Storage, Paint Shop and Paint Equipment Storage: Extra Hazard Group 2, 0.40 gpm/sq ft over 2,500 sq ft with 500 gpm hose allowance.
  - 4. Warehouse/Shop Building:
    - a. Corridor, Offices, Restrooms, Break room and Electrical Lab: Light hazard, 0.10 gpm/sq. ft over entire room with 100 gpm hose allowance.
    - b. Mechanical Room: Ordinary hazard group 1, 0.15 gpm/sq. ft over entire room with 250 gpm hose allowance.
    - c. Wood Shop, Carpenter Shop, Electrical Shop, Storage Mezzanine and Janitorial: Ordinary hazard group 2, 0.20 gpm/sq. ft over 1,500 sq ft with 250 gpm hose allowance.
    - d. Warehouse: Protect entire warehouse area for on tread storage of rubber tires on portable racks to a maximum height of 6'. Minimum discharge density shall be 0.32 gpm/sq ft over 2,000 sq ft with 500 gpm hose allowance.
    - e. Electrical Shop: Protect single row rack storage of non-encapsulated class I – IV commodities stored to a maximum of 20' with a fire sprinkler discharge density of 0.495 gpm/sq ft over entire area covered by racks (plus 15' buffer zone). Hydraulic calculations shall include a design area of 2,000 sq ft (area outside rack foot print and 15' buffer zone may be calculated at OH2 density) and an outside hose allowance of 500 gpm.
  - 5. The size of the remote area may be decreased, where applicable, in accordance with NFPA 13 11.2.3.2.3.1 where quick response sprinklers are used.
  - 6. The design area shall be the hydraulically most remote rectangular area having a dimension parallel to the branch line equal to, or greater than, 1.2 times the square root of the area of sprinkler operation.
- B. Maximum coverage per sprinkler.
- 1. Extra Hazard areas High Piled Storage and Warehouse: 100 sq. ft
  - 2. Ordinary Hazard: 130 sq. ft.
  - 3. Light Hazard: 225 sq. ft
  - 4. Sprinkler spacing may exceed that listed above if extended coverage sprinklers are used. Spacing for extended coverage sprinklers shall be in accordance with the manufacturer's cut sheet for the specific sprinkler used.
- C. Fire sprinkler system shall be hydraulically calculated. The following water pressure and flow shall be used as the basis for the hydraulic calculations:
- |                    |           |
|--------------------|-----------|
| Static Pressure:   | 91 psi    |
| Residual Pressure: | 80 psi    |
| Flow:              | 1,343 gpm |

The water pressure and flows reported above based on a flow test conducted 4/14/06 using existing hydrants connected to 8" looped site main and reduced by 20% in accordance with the engineer's water supply analysis. No addition reduction of the flow test or pressure margin in hydraulic calculations will be required.

- D. Hydraulic calculations for the fire sprinkler system shall extend to the point of connection with the existing 8" looped site main near each building.

#### 1.9 WARRANTY

- A. Materials, equipment, and workmanship shall be free from defects for 12 months from the "Date Left in Service with All Control Valves Open," shown on "Contractor's Material and Test Certificate." If any Work is found to be defective, Contractor shall promptly, without cost to Owner, and in accordance with Owner's instructions, either correct such defective Work, or if it has been rejected by Owner, remove it from the site and replace it with non-defective Work. Submit two copies of Warranty Certificates to Engineer.

#### 1.10 REFERENCES

- A. NFPA (National Fire Protection Association) 13, "Installation of Sprinkler Systems," 2002.
- B. NFPA 24, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances", 2002.
- C. NFPA 70, "National Electrical Code", 2005.
- D. NFPA 72, "National Fire Alarm Code", 2002.
- E. IFC (International Fire Code), 2003
- F. IBC (International Building Code), 2003
- G. IBC Standards, 2003.
- H. Underwriters Laboratories "Fire Protection Equipment Directory," current edition.
- I. Factory Mutual Systems "Approval Guide," current edition.

### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. Materials, devices and equipment shall be Underwriters Laboratories listed or Factory Mutual approved for use in fire protection systems.

#### 2.2 PIPE

- A. Interior Piping: All piping shall be steel and shall meet or exceed the following standards: ASTM A795, ANSI/ASTM A53, ASTM A135, ANSI B36-10M, UL CRR (Corrosion Resistance Rating) minimum 1.0 for threaded pipe.
- B. Underground Piping:
  - 1. All underground piping to be approved for potable water use.
  - 2. PVC, Class 150, AWWA C900.
  - 3. Ductile iron, Class 50, AWWA C104, C105, C110, C115, C150, C151 and/or C160.
    - a. All ductile iron pipe shall be encased within polyethylene per ANSI A21.5.

## 2.3 FITTINGS

- A. Interior Piping:
  - 1. Cast iron threaded, ANSI B16.4.
  - 2. Cast iron flanged, ANSI B16.1.
  - 3. Malleable iron threaded, ANSI B16.3.
  - 4. Forged steel fittings, socket welded and threaded, ANSI B16.11.
  - 5. Plain end couplings and fittings, saddle couplings, and clamp type couplings are not acceptable.
  - 6. Other types of fittings may be used, but only those investigated and listed for this service and approved by the project engineer.
- B. Underground Piping:
  - 1. Chlorinated Polyvinyl Chloride (CPVC), ASTM F437 and/or F439.
  - 2. Ductile iron or cast iron, ASME B16.4, B16.1 and/or B16.3.

## 2.4 HANGERS

- A. Hangers shall conform to the minimum requirements of NFPA 13.

## 2.5 SEISMIC FITTINGS AND BRACES

- A. Sway bracing is required and shall conform to the minimum requirements of NFPA 13.

## 2.6 SPRINKLERS

- A. Ordinary and light hazard areas without ceilings: 1/2" orifice, small frame, quick response upright or pendent, ordinary or intermediate temperature, glass bulb. Use brass finish if the surrounding structure is unpainted or a factory white finish if the surrounding structure is painted.
- B. Extra hazard and Warehouse areas without ceilings: Large or extra Large orifice, standard response, upright or pendent, high temperature, glass bulb. Use brass finish if the surrounding structure is unpainted or a factory white finish if the surrounding structure is painted.
- C. Areas with finished ceilings: Small frame, quick response, ordinary temperature, chrome or white with matching 2-piece recessed escutcheons. Sprinklers shall be located within 2" of the center or quarter points of the ceiling tiles.



- D. Sprinklers of intermediate and high temperature ratings shall be installed in specific locations as required by NFPA 13.
- E. All sprinklers installed in areas designated as light hazard shall be quick response type sprinklers.
- F. Provide a minimum of one spare head of each type for spare head cabinet and one head wrench for each type sprinkler. The minimum number of spare sprinklers provided shall be in accordance with NFPA 13.

## 2.7 VALVES

- A. Fire Sprinkler System Risers:
  - 1. Provide a double check backflow prevention assembly with butterfly pattern control valves and pressure gauges on both sides of device. Ames Colt Series C200BFG or equal.
  - 2. 2" angle valve for main drain. Extend discharge from main drain to building exterior.

## 2.8 FIRE DEPARTMENT CONNECTION

- A. Administration and Laboratory Building: Provide a polished brass, 2-way by 2-1/2" wall mount fire department connection with national standard threads, breakable caps and permanent sign labeled "Auto. Spkr.". Mount FDC between 18" and 48" above finished exterior grade.
- B. Heavy Equipment/Paint Storage and Warehouse/Shop Buildings: Provide a flush mounted, chrome, 4-way wall mount fire department connection with national standard threads, threaded caps and permanent sign labeled "Auto. Spkr.". Mount FDC between 18" and 48" above finished exterior grade.
- C. Swing pattern, grooved end check valve.
- D. 1/2" automatic ball drip.

## 2.9 ALARM DEVICES: Note: Devices are furnished and installed by fire sprinkler contractor and wired by fire alarm contractor.

- A. Valve tamper switches: The valve tamper switches shall be SPDT electrical switches rated for 125 Vac for monitoring the position of control. Switches shall be built-in on the butterfly pattern control valves.
- B. Water flow switch: Furnish and install a water flow detector for each riser designed for wet pipe sprinkler systems, listed by UL and approved by Factory Mutual. Detector shall be vane type installed above the riser check valve for actuation of two SPDT switches rated for 125 Vac at water flows of 10 gpm or greater.
- C. Exterior alarm shall be installed above each FDC as specified in section 13851.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Inspect job site prior to fabricating materials. Coordinate and sequence installation with the progress of other mechanical and structural systems and components.
- B. Contractor shall be responsible to attend a mandatory pre-bid walk through of the building. If required, an additional pre-bid inspection can be arranged. The contractor shall be responsible to examine all areas and conditions under which fire sprinkler systems are to be installed and identify conditions detrimental to proper completion of the work. All unsatisfactory conditions shall be specifically identified in the bid.

### 3.2 INSTALLATION

- A. Install systems in compliance with methods detailed in NFPA 13 including seismic requirements for Area 3.
- B. Offset as needed for other trades. Avoid conflict in areas of tight construction. Do not obstruct access to air control boxes, access doors, lights or other ceiling mounted equipment.
- C. Submit piping and equipment data sheets for review by the Engineer/Engineer prior to ordering or fabricating equipment.
- D. Close pipe openings with caps or plugs during installation. Cover and protect components of the system against dirt and chemical or mechanical injury.
- E. Provide concrete splash blocks for drains test valve discharge, etc. Concrete splash blocks shall be pre-fabricated, 2-1/2" thick, Amcor or Engineer approved equal. Where valves discharge to permanent paved surface splash blocks are not required.
- F. Piping shall only be installed in areas where temperatures will not drop below 40 deg F. If piping must be installed in areas where the temperature is not maintained above 40 °F, the piping must be part of a dry-pipe system in conformance with the requirements of NFPA 13. Small isolated areas subjected to freezing temperatures may be protected by a fire sprinkler piping filled with an antifreeze solution in as allowed by NFPA 13.
- G. Provide white painted escutcheons around exposed piping where piping passes through walls or ceilings in a finished area.
- H. Provide through penetration fire-stop systems to protect piping penetrations through rated walls or floors. The rating of the through penetration fire-stop system shall be equivalent to the rating of the wall or floor penetrated.

### 3.3 FIELD QUALITY CONTROL

- A. Obtain permits and post bonds as required by state and local AHJ's (Authorities Having Jurisdiction).
- B. Inform AHJ's of job progress. Request presence of AHJ'S, perform tests, and document results using Contractor's Material and Test Certificates.

### 3.4 TESTING

- A. Complete flush underground piping in accordance with NFPA 13 10.10.2.1. Document flushing test on Contractor's Material and Test Certificate for Underground Piping. Do not connect underground piping to overhead piping until after flushing tests have been completed.
- B. Provide hydrostatic test on underground piping in accordance with NFPA 13 10.10.2.2.
- C. Hydrostatically test all overhead piping for two hours at 200 psi (or 50 psi higher than the maximum anticipated static pressure) with no loss in pressure and no visible leakage. Conduct the testing after all of the fire sprinklers and piping are installed. Have the tests witnessed by the AHJ's and Engineer. Submit a Contractor's Material and Test Certificate to the Engineer upon successful completion of the testing.
- D. Perform all system operation tests required by NFPA 13. Every water flow detector used on the project must be tested to ensure proper operation and retard settings.
- E. Train the Owner's maintenance personnel in the proper operation, testing and maintenance of all installed equipment.
- F. Conduct an inspection and operational test (main drain and inspector's test) at the end of the one-year guarantee period. The inspection and testing shall be in accordance with manufacturer's recommendations and NFPA 25. A written report is to be sent to the Owner upon completion of the inspection. Fire sprinkler installer shall conduct the tests.

### 3.5 CLEANING

- A. Remove oil, scale, debris, and foreign substances from interior and exterior of devices, equipment, and materials prior to installation.
- B. Upon job completion, remove tools, surplus materials and equipment, leaving all areas broom clean.

### 3.6 DISINFECTION

- A. Introduce dosage of 50 PPM chlorine in overhead piping. During the contact period open and close all system valves several times. At end of 24-hour retention period at least 10 PPM shall remain throughout the piping.
- B. At end of retention period, flush system until residual chlorine is reduced to less than 1.0 PPM.

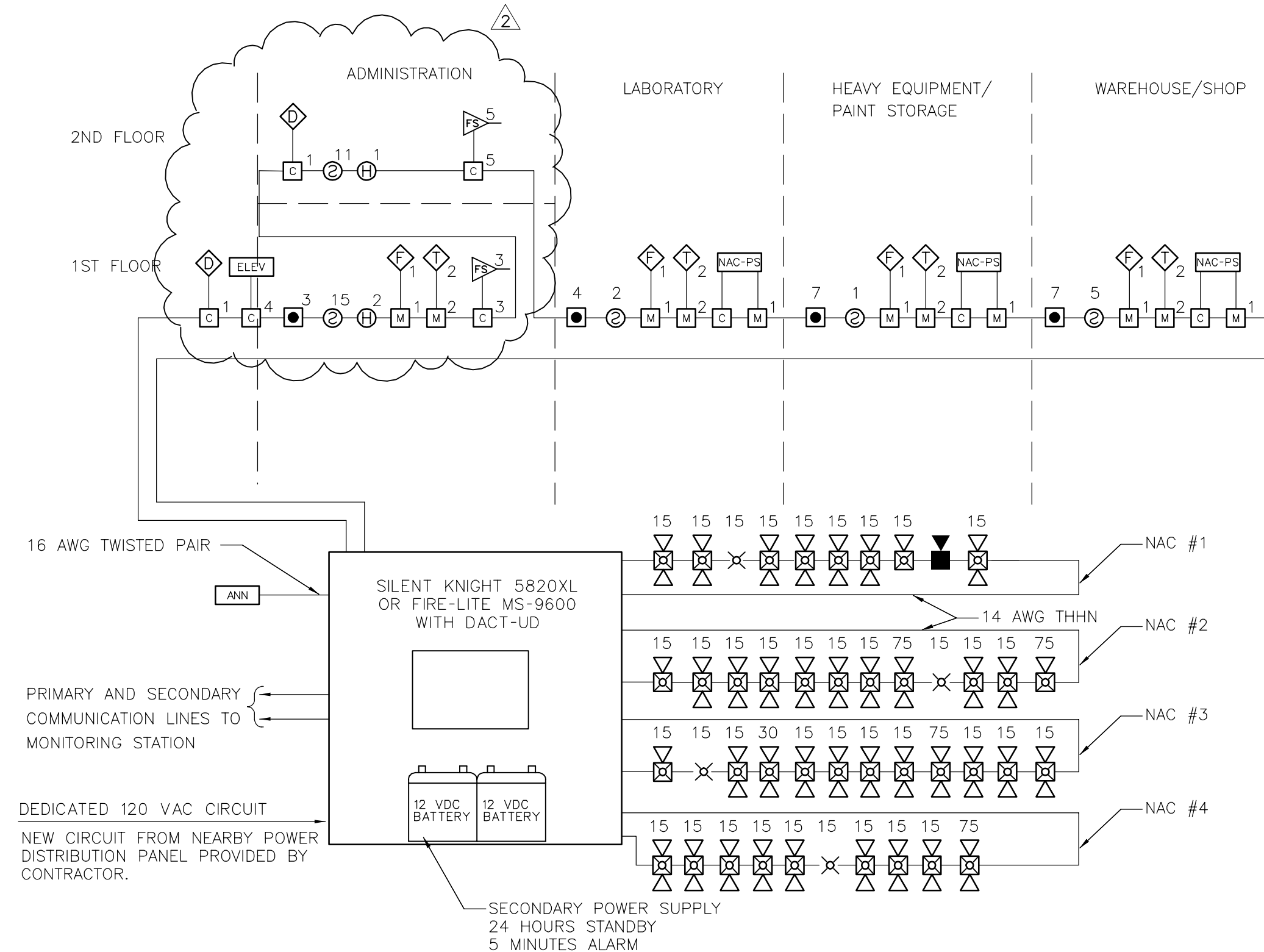
### 3.7 ACCEPTANCE

- A. Acceptance of installation is subject to final inspection and approval by:
  - 1. State of Utah DFCM
  - 2. Utah State Fire Marshal
  - 3. Project Engineer

End of Section 13930

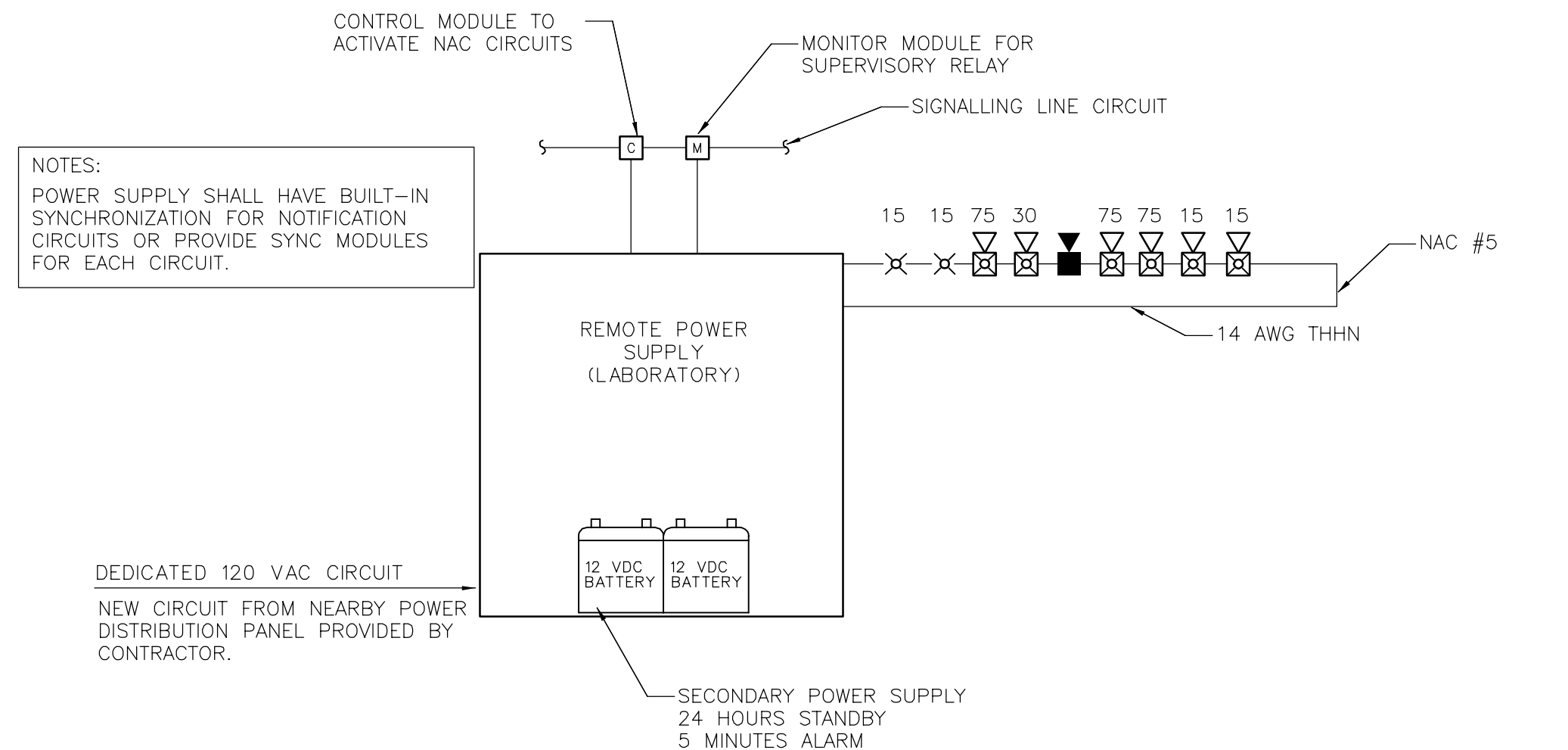
# 1 FIRE ALARM SINGLE LINE RISER DIAGRAM

N.T.S.



# 2 REMOTE NAC POWER SUPPLY – LABORATORY

N.T.S.



## FIRE ALARM SYSTEM GENERAL NOTES

- SCOPE OF WORK: WORK SHALL INCLUDE INSTALLATION OF NEW ADDRESSABLE FIRE ALARM SYSTEM INCLUDING ALL CONTROL EQUIPMENT, POWER SUPPLIES, INITIATING DEVICES AND DEVICES, NOTIFICATION APPLIANCE CIRCUITS AND DEVICES REQUIRED TO CONSTITUTE A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM THROUGHOUT BUILDING IN ACCORDANCE WITH NFPA 72, IBC, IFC THESE DRAWINGS AND PROJECT SPECIFICATIONS.
- APPLICABLE CODES/STANDARDS: INTERNATIONAL BUILDING CODE - 2003 EDITION INTERNATIONAL FIRE CODE - 2003 EDITION UTAH STATE FIRE MARSHAL RULE R710-4 NFPA 70 - 2002 EDITION NFPA 72 - 2002 EDITION
- QUALITY ASSURANCE: ALL EQUIPMENT, MATERIAL AND DEVICES USED FOR THE FIRE ALARM SYSTEM INSTALLATION SHALL BE UL LISTED AND/OR FM APPROVED FOR USE IN FIRE PROTECTION SYSTEMS. ALL INITIATING DEVICES SHALL BE LISTED COMPATIBLE WITH THE FIRE ALARM CONTROL PANEL (FACP). MAJOR SYSTEM COMPONENTS (CONTROL PANELS, INITIATING DEVICES, ADDRESSABLE MODULES, AND RELAYS, POWER SUPPLIES, ETC.) SHALL BE FROM A STATE OF UTAH DFCM APPROVED MANUFACTURER. APPROVED MANUFACTURERS INCLUDE FIRE-LITE AND SILENT KNIGHT.
- SUBMITTALS: FIRE ALARM SYSTEM CONTRACTOR SHALL PREPARE AND SUBMIT SHOPS DRAWINGS TO UTAH STATE FIRE MARSHAL'S OFFICE, OWNER AND ENGINEER FOR REVIEW/APPROVAL PRIOR TO ORDERING OR INSTALLING ANY EQUIPMENT. SUBMITTALS SHALL CONFORM TO THE CONSTRUCTION DOCUMENTS REQUIREMENTS OF IFC 907.1.1.
- SYSTEM TYPE: FIRE ALARM SYSTEM SHALL MEET THE REQUIREMENTS FOR PROTECTED PREMISE FIRE ALARM SYSTEMS. SYSTEM SHALL PROVIDE OFF-PREMISE NOTIFICATION OF STATUS TO CENTRAL STATION DETERMINED BY OWNER. PROVIDE A SINGLE FACP FOR ALL 4 BUILDINGS. EXTEND SLC FROM ONE BUILDING TO THE NEXT VIA EXISTING UNDERGROUND CONDUIT (COORDINATE WITH OWNER). TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATIONS. PROVIDE CIRCUIT EXTENDERS/BOOSTERS AS REQUIRED. PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSION ON ALL CIRCUITS WHERE THEY ENTER OR LEAVE A BUILDING.
- OCCUPANT NOTIFICATION: NOTIFICATION CIRCUITS SHALL BE ZONED WITH ONE ZONE PER BUILDING. PROVIDE REMOTE NOTIFICATION POWER SUPPLIES IN EACH BUILDING TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONFIGURE NOTIFICATION CIRCUITS IN EACH BUILDING TO ACTIVATE ONLY UPON OCCUPANT NOTIFICATION.
- WIRING/CONDUIT: ALL WIRING TO BE FREE OF OPEN, SHORTS AND GROUNDS. INSTALL ALL WIRING IN MINIMUM 1/2" RIGID CONDUIT, EMT, RED MC. CONDUIT INSTALLATION SHALL CONFORM TO ALL APPLICABLE REQUIREMENTS OF NEC (NFPA 70) AND DFCM STANDARDS. ALL CONDUIT PENETRATIONS THROUGH RATED PARTITIONS SHALL BE FIRE STOPPED WITH A SUITABLE CAULKING COMPOUND. ALL WIRING USED IN THE FIRE ALARM SYSTEM SHALL BE FPL (FIRE POWER) WIRING WITH 300 V INSULATION OR EQUIVALENT AS PER NFPA 70 ARTICLE 760.
- WIRING STYLE: PER NFPA 72, INITIATING DEVICE CIRCUITS SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE D CIRCUITS. SIGNALING LINE CIRCUITS SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE 6 OR 7 CIRCUITS. NOTIFICATION APPLIANCE CIRCUITS SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE Z.
- POWER: INSTALL NEW DEDICATED BRANCH CIRCUIT PER NFPA 70 AND NFPA 72 TO PROVIDE PRIMARY POWER TO NEW FACP AND EACH REMOTE POWER SUPPLY. FURNISH A BATTERY BACKUP TO PROVIDE SECONDARY POWER SUPPLY TO FACP AND REMOTE POWER SUPPLIES. BATTERY BACKUP SHALL BE OF SUFFICIENT CAPACITY TO PROVIDE 24 HOURS OF STANDBY POWER WITH AN ADDITIONAL RESERVE TO OPERATE SYSTEM FOR 5 MINUTES IN ALARM.
- INITIATING DEVICES: SLC LOOP DEVICE ADDRESSING SHALL NOT EXCEED 127 DETECTORS (SMOKES, HEATS, DUCT, SMOKES, ETC.) OR 127 MODULES (PULL STATIONS, MONITOR, CONTROL, ETC.) PER LOOP. AT LEAST 19 ADDRESSES (152) SHOULD BE LEFT VACANT ON EACH SLC LOOP IN ORDER TO ALLOW SPACE FOR ADJUSTMENTS.

SMOKE DETECTORS: PROVIDE SMOKE DETECTORS WHERE SHOWN ON PLANS IN ALL CORRIDORS, LOBBIES, ELEVATOR EQUIPMENT ROOM AND ABOVE FIRE ALARM CONTROL EQUIPMENT. MAXIMUM SPACING OF DETECTORS SHALL BE 30' BETWEEN OR 15' FROM FURTHEST WALL.

MANUAL PULL STATIONS: INSTALL PULL STATIONS AT EACH BUILDING EXIT AS SHOWN ON PLANS. MOUNT PULL STATIONS AT 48" AFF ON RECESSED JUNCTION BOXES.

HEAT DETECTORS: PROVIDE HEAT DETECTORS WHERE SHOWN ON PLANS IN ELEVATOR EQUIPMENT ROOM AND ELEVATOR PIT. MAXIMUM SPACING FOR HEAT DETECTORS SHALL BE 50' BETWEEN DETECTORS OR 25' FROM FURTHEST WALL.

- ADDRESSABLE MODULES: PROVIDE ADDRESSABLE MODULES WITH EXTERNALLY VISIBLE LED TO MONITOR CONVENTIONAL DEVICES (WATER FLOW SWITCHES, VALVE TAMPER SWITCHES, ETC.). LOCATE MONITOR MODULE ADJACENT TO FLOW OR TAMPER SWITCH IN AN ACCESSIBLE LOCATION. LABEL AS PART OF THE FIRE ALARM SYSTEM WITH THE NAME OF THE DEVICE. MONITORED ON THE COVER OF THE JUNCTION BOX.
11. NOTIFICATION APPLIANCES: PROVIDE AUDIBLE AND VISUAL NOTIFICATION APPLIANCES THROUGHOUT EACH BUILDING IN ACCORDANCE WITH PUBLIC MODE SIGNALING REQUIREMENTS OF NFPA 72. VOLUME OF HORNS AND SPEAKERS SHALL BE SUFFICIENT TO PROVIDE A SOUND LEVEL OF 15 DB ABOVE AMBIENT IN ALL OCCUPIED AREAS. VISIBLE ALARMS SHALL BE PROVIDED THROUGHOUT ALL PUBLIC AREAS OF THE BUILDING AS WELL AS PRIVATE OFFICES AND AREAS WITH POSSIBLE OCCUPANCY BY HEARING IMPAIRED PERSONS. PROVIDE SYNCHRONIZATION OF STROBE FLASHES.
12. FIRE SAFETY FUNCTIONS:
- ELEVATOR RECALL: CONTROL MODULES WITH RELAY CONTACTS SHALL BE INSTALLED AND PROGRAMMED TO PROVIDE ELEVATOR RECALL AND ELEVATOR POWER SHUNT TRIP. THE CONTROL RELAY MODULES SHALL BE INSTALLED WITHIN 36" OF DEVICE OR CIRCUIT CONTROLLED. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY NUMBER AND LOCATION OF DEVICES TO BE CONTROLLED.
- FIRE/SMOKE DAMPERS: PROVIDE CONTROL MODULES WITH RELAY CONTACTS TO RELEASE ALL EXISTING FIRE/SMOKE DAMPERS. INSTALL MODULE WITH 36" OF DAMPER OR POWER CIRCUIT TO DAMPER MODULE SHALL BE LISTED FOR VOLTAGE AND CURRENT REQUIRED TO OPERATE DAMPERS. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY NUMBER AND LOCATION OF DAMPERS TO BE CONTROLLED.
13. TESTING: SCHEDULE AND PERFORM ALL ACCEPTANCE TESTS REQUIRED BY NFPA 72. TESTING SHALL BE WITNESSED BY UTAH STATE FIRE MARSHAL'S OFFICE, PROJECT ENGINEER, DFCM AND BUILDING MAINTENANCE PERSONNEL. SUBMIT A WRITTEN TESTING PLAN DETAILING EACH TEST TO BE PERFORMED TO EACH AGENCY AT LEAST THREE DAYS PRIOR TO SCHEDULED TEST.
14. DEMOLITION: CONTRACTOR SHALL REMOVE EXISTING SYSTEM (CONTROL PANEL, POWER SUPPLY, DETECTORS, WIRING, ETC.) THAT PROVIDES ELEVATOR RECALL FUNCTIONS AND ACTIVATION OF FIRE/SMOKE DAMPERS. ELEVATOR RECALL AND DAMPER ACTUATION TO BE PROVIDED BY NEW FIRE ALARM SYSTEM.

## FIRE ALARM SYSTEM KEY NOTES

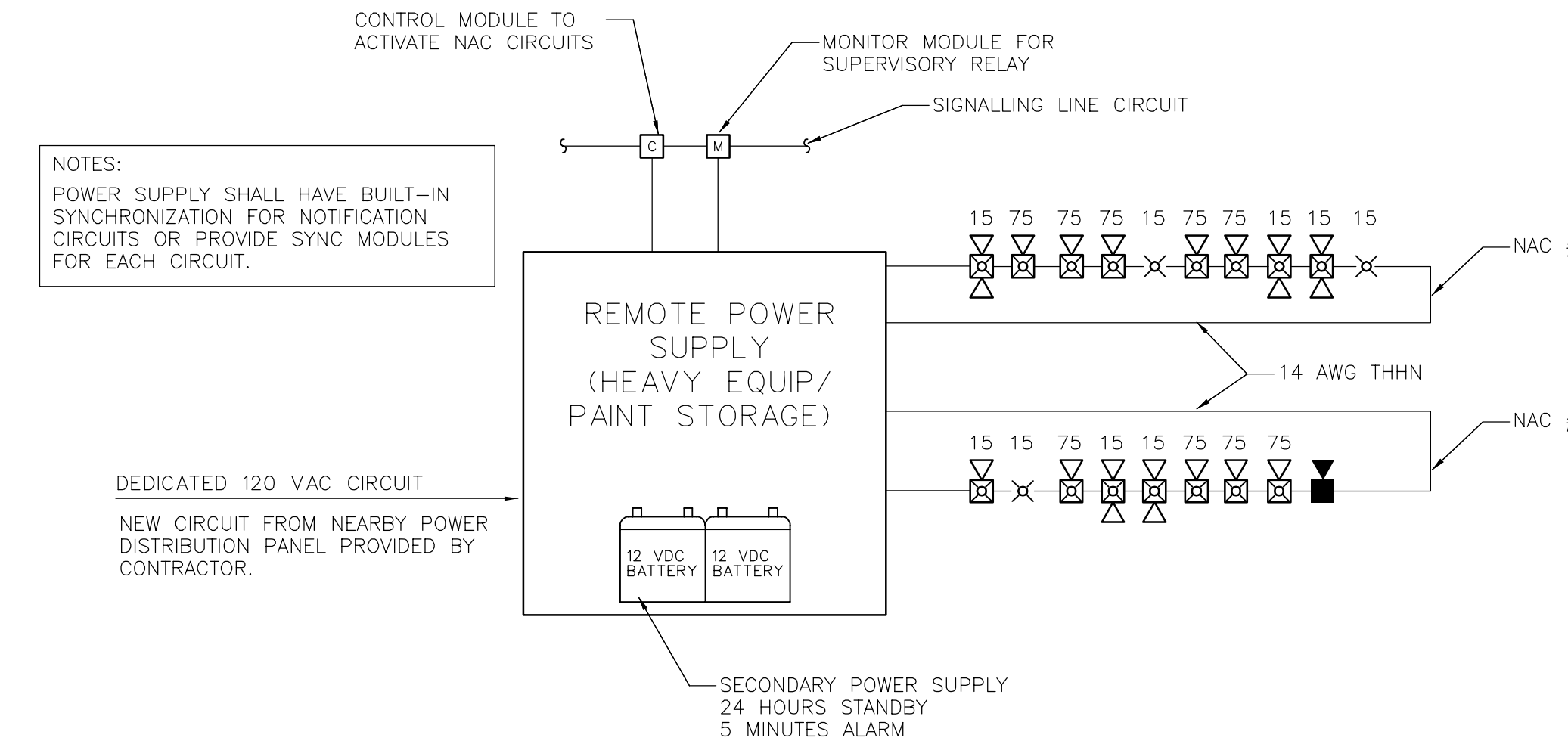
- FURNISH AND INSTALL NEW ADDRESSABLE FIRE ALARM CONTROL PANEL (FACP) FOR UDOT REGION 3 COMPLEX (4 BUILDINGS). INSTALL FACP IN ADMINISTRATION BUILDING AND EXTEND SIGNALING LINE CIRCUIT BETWEEN BUILDINGS USING EXISTING UNDERGROUND CONDUIT PROVIDED BY OWNER (WIRE BY CONTRACTOR). FACP SHALL BE SILENT KNIGHT 5820 XL OR FIRE-LITE MS-9600 WITH DACT-UD. EXTEND PHONE LINES (PRIMARY AND SECONDARY) FROM EXISTING TELEPHONE TERMINAL BOARD TO FACP TO PROVIDE OFF-PREMISE MONITORING. INSTALL FACP CABINET RECESSED INTO WALL.
- FURNISH AND INSTALL NEW REMOTE ANNUNCIATOR PANEL (KEYPAD WITH ALPHANUMERIC READ OUT) FOR FIRE ALARM SYSTEM. LOCATE ANNUNCIATOR NEAR MAIN ENTRANCE OF ADMINISTRATION BUILDING AS SHOWN ON PLANS. LOCATION OF ANNUNCIATOR PANEL MAY BE ADJUSTED BY CONTRACTOR TO FACILITATE INSTALLATION BUT THE PANEL SHALL BE VISIBLE FROM THE MAIN ENTRANCE DOORS TO THE BUILDING. WALL MOUNT ANNUNCIATOR AT 54" AFF. ANNUNCIATOR SHALL BE MOUNTED ON RECESSED TYPE JUNCTION BOX AND CONDUIT TO BOX SHALL BE CONCEALED IN WALL.
- NEW FIRE SPRINKLER SYSTEM RISER. INSTALL ADDRESSABLE MONITOR MODULE AT EACH WATER FLOW SWITCH AND VALVE SUPERVISORY SWITCH TO FACILITATE MONITORING OF SWITCH AS AN ADDRESSABLE POINT. MONITOR MODULE SHALL MOUNT IN 4 - SQUARE JUNCTION BOX AND BE EQUIPPED WITH AN EXTERNAL LED VISIBLE FROM FLOW OR VALVE SUPERVISORY SWITCH. PROGRAM ACTIVATION OF WATER FLOW SWITCH AS AN ALARM SIGNAL AND ACTIVATION OF VALVE SUPERVISORY SWITCHES AS A SUPERVISORY SIGNAL.
- EXTEND SIGNALING LINE CIRCUIT(S) (SLC) FROM FACP IN ADMINISTRATION BUILDING TO INITIATING DEVICES AND REMOTE NOTIFICATION CIRCUIT POWER SUPPLIES IN LABORATORY, HEAVY EQUIPMENT/PAINT STORAGE, AND WAREHOUSE/SHOP BUILDINGS. INSTALL SLC IN EXISTING BURIED CONDUITS THAT RUN BETWEEN ELECTRICAL ROOM IN EACH BUILDING AND UNDERGROUND VAULT LOCATED BETWEEN ADMINISTRATION AND LABORATORY BUILDING (SEE SHEET FP-1.1). PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSORS IN ACCORDANCE WITH NFPA 70 ARTICLE 285 ON SLC AT EACH POINT THAT THE CIRCUIT ENTERS OR EXITS A BUILDING. TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER RECOMMENDATIONS. PROVIDE ADDITIONAL SLC CIRCUITS OR CIRCUIT EXTENDER/REPEATER AS REQUIRED. CABLE INSTALLED IN BURIED CONDUITS SHALL BE SUITABLE FOR INSTALLATION SUBMERGED IN WATER.
- FURNISH AND INSTALL A REMOTE POWER SUPPLY TO POWER NOTIFICATION APPLIANCE CIRCUITS (NAC) FOR THE LABORATORY, HEAVY EQUIPMENT/PAINT STORAGE AND WAREHOUSE/SHOP BUILDINGS. PROVIDE AN ADDRESSABLE RELAY MODULE TO ACTIVATE NAC CIRCUITS UPON OPERATION OF INITIATING DEVICES IN THAT BUILDING ONLY. PROVIDE AN ADDRESSABLE MONITOR MODULE TO SUPERVISE TROUBLE CONTACTS OF REMOTE POWER SUPPLY. INSTALL BATTERIES TO PROVIDE SECONDARY POWER SUPPLY FOR 24 HOURS IN STANDBY AND 5 MINUTES IN ALARM. LAYOUT OF NAC CIRCUITS SHALL LIMIT VOLTAGE DROP BETWEEN POWER SUPPLY AND MOST REMOTE APPLIANCE TO LESS THAN 20%. PROVIDE MODULES AS REQUIRED TO SYNCHRONIZE STROBE FLASHES OF ALL NOTIFICATION APPLIANCES WITHIN A SINGLE FIELD OF VIEW. LOCATION OF REMOTE POWER SUPPLY MAY BE ADJUSTED IN FIELD AS REQUIRED TO COORDINATE WITH EXISTING BUILDING SYSTEMS AND EQUIPMENT.
- FURNISH AND INSTALL SMOKE DETECTORS AT EACH ELEVATOR LOBBY AND IN THE ELEVATOR EQUIPMENT ROOM TO PROVIDE ELEVATOR RECALL FUNCTIONS IN ACCORDANCE WITH NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAY AND SHUNT TRIP BREAKER TO DISCONNECT POWER TO ELEVATOR EQUIPMENT UPON OPERATION OF EITHER HEAT DETECTOR. CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL HEAT DETECTORS ADJACENT TO FIRE SPRINKLERS IN ELEVATOR PIT AND ELEVATOR MACHINE ROOM. HEAT DETECTORS SHALL CONFORM TO NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAY AND SHUNT TRIP BREAKER TO DISCONNECT POWER TO ELEVATOR EQUIPMENT UPON OPERATION OF EITHER HEAT DETECTOR. CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL ADDRESSABLE RELAY TO PROVIDE ACTUATION OF FIRE/SMOKE DAMPERS. RELAY SHALL BE NORMALLY ENERGIZED AND RATED FOR VOLTAGE AND CURRENT REQUIRED FOR DAMPER ACTUATION.
- PROVIDE PROGRAMABLE RELAY TO RELEASE EXISTING DOOR HOLD-OPEN DEVICES ON EXISTING FIRE DOORS. RELAY SHALL RELEASE DOORS UPON RECEIPT OF ANY FIRE ALARM SIGNAL AT FACP. POWER TO DOOR HOLD-OPEN DEVICES SHALL BE PROVIDED BY FACP.

## FIRE ALARM EQUIPMENT LEGEND

DEVICE	DESCRIPTION	MOUNTING	REMARKS
FACP	FIRE ALARM CONTROL PANEL	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	SILENT KNIGHT MODEL 5820XL OR FIRE-LITE MODEL MS-9600 WITH DACT-UD.
ANN	FIRE ALARM ANNUNCIATOR PANEL	WALL MOUNT ON RECESSED J-BOX AT 54" AFF.	KEY PAD WITH ALPHA-NUMERIC (MINIMUM 80 CHARACTERS) WITH INPUT KEYS TO ALLOW SYSTEM RESET AND ALARM SILENCE.
NAC-PS	REMOTE POWER SUPPLIES FOR NOTIFICATION APPLIANCE CIRCUITS	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONTROLLED BY ADDRESSABLE RELAY ON SIGNALING LINE CIRCUIT.
⊙	ADDRESSABLE SMOKE DETECTOR	CEILING MOUNT ON RECESSED J-BOX.	INSTALL ON CEILING IN ALL CORRIDORS, LOBBIES AND ABOVE FIRE ALARM CONTROL EQUIPMENT AS INDICATED ON PLANS.
⊕	ADDRESSABLE HEAT DETECTOR	SURFACE MOUNT ON J-BOX WITHIN 24" OF FIRE SPRINKLER.	TO PROVIDE POWER DISCONNECT TO ELEVATOR PRIOR TO OPERATION OF ADJACENT SPRINKLER.
■	ADDRESSABLE PULL STATION	WALL MOUNT AT 48" AFF ON RECESSED J-BOX. CONDUIT SHALL BE CONCEALED IN WALL.	INSTALL AT EACH EXIT DOOR AS INDICATED ON PLANS.
IV	ADDRESSABLE MONITOR MODULE	MOUNT ON 4-SQUARE J-BOX NEAR CONVENTIONAL INITIATING DEVICES AS AN ADDRESSABLE POINT.	TO FACILITATE MONITORING OF CONTACTS OF CONVENTIONAL INITIATING DEVICES AS AN ADDRESSABLE POINT.
□	ADDRESSABLE CONTROL MODULE	MOUNT ON 4 - SQUARE J-BOX WITHIN 3' OF DEVICE OR CIRCUIT CONTROLLED.	FOR PROTECTED PREMISE FIRE SAFETY FUNCTIONS (ELEVATOR RECALL AND NAC ACTIVATION).
◇	WATER FLOW SWITCH	FIRE SPRINKLER RISER.	TO DETECT WATER FLOW IN FIRE SPRINKLER SYSTEM.
◇	VALVE SUPERVISORY SWITCH	FIRE SPRINKLER CONTROL VALVES.	TO MONITOR POSITION OF CONTROL VALVES.
✕	FIRE ALARM STROBE	WALL MOUNT AT 80" AFF OR CEILING MOUNT ON RECESSED J-BOX.	STROBE SHALL HAVE A MINIMUM CANDELA RATING OF 1500 INTENSITY. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW.
⊠	FIRE ALARM HORN/STROBE (WALL)	WALL MOUNT AT 80" AFF ON RECESSED J-BOX.	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
⊠	FIRE ALARM HORN/STROBE (CEILING)	CEILING MOUNTED ON RECESSED J-BOX.	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
■	EXTERIOR FIRE ALARM HORN	WALL MOUNT AT 10'-0" AFF ON WEATHER PROOF BACK BOX.	EXTERIOR ALARM. SET HORN VOLUME TO MAXIMUM LEVEL.
⊠	FIRE/SMOKE DAMPER	EXISTING.	PROVIDE ADDRESSABLE MODULE FOR CONTROL.
◇	MAGNETIC CONTACT DOOR HOLDER	EXISTING.	PROVIDE CONTINUOUS 24 VDC POWER FROM FACP TO USER. PROVIDE CONTROL MODULE AND PROGRAM TO DISCONNECT POWER AND RELEASE DOORS UPON RECEIPT OF FIRE ALARM SIGNAL.

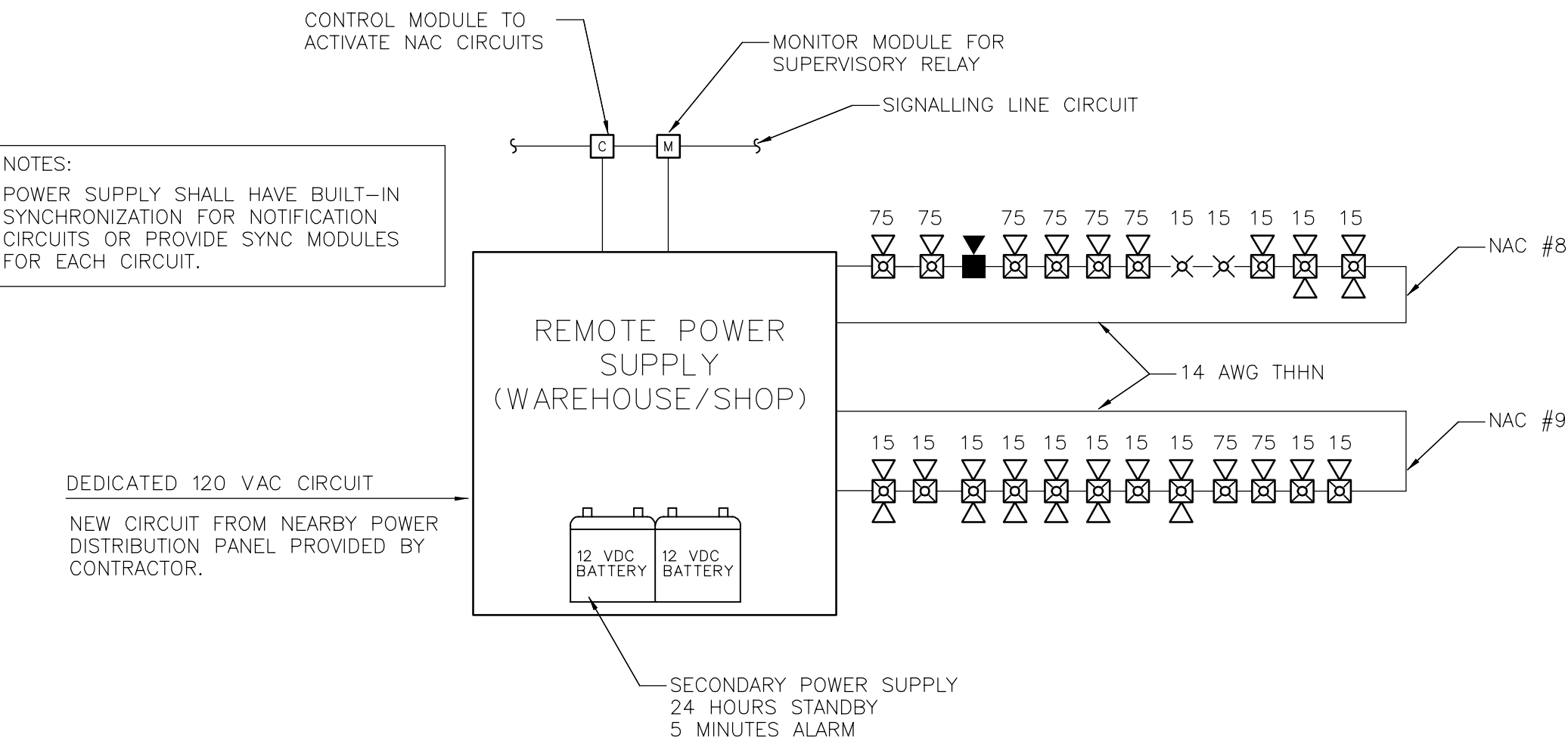
# 3 REMOTE NAC POWER SUPPLY – HEAVY EQ/PAINT STG

N.T.S.



# 4 REMOTE NAC POWER SUPPLY – WAREHOUSE/SHOP

N.T.S.



DRAWING DATE:  
06/13/06

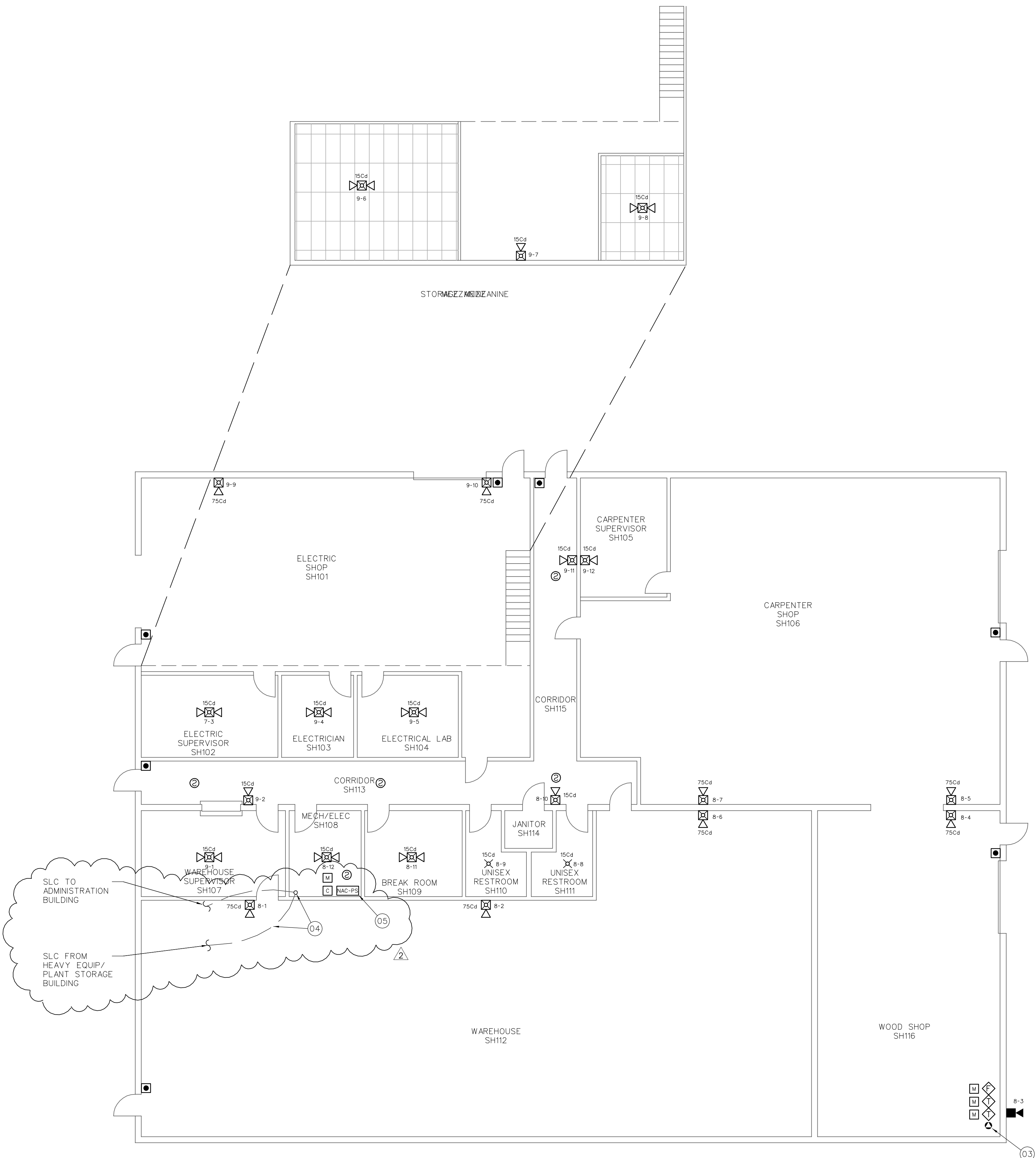
REVISION DATE:  
07/19/06

UDOT REGION 3  
PROVO, UTAH

FIRE ALARM SYSTEM UPGRADES  
DFCM PROJECT #05233900

FIRE ALARM SYSTEM  
DETAILS  
FP-3.6





FIRE ALARM SYSTEM PLAN – WAREHOUSE/SHOP BUILDING  
1/8" = 1'-0"

FIRE ALARM SYSTEM GENERAL NOTES

- SCOPE OF WORK: WORK SHALL INCLUDE INSTALLATION OF NEW ADDRESSABLE FIRE ALARM SYSTEM INCLUDING ALL CONTROL EQUIPMENT, POWER SUPPLIES, INITIATING DEVICES AND DEVICES, NOTIFICATION APPLIANCE CIRCUITS AND DEVICES REQUIRED TO CONSTITUTE A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM THROUGHOUT BUILDING IN ACCORDANCE WITH NFPA 72, IBC, IFC THESE DRAWINGS AND PROJECT SPECIFICATIONS.
- APPLICABLE CODES/STANDARDS:  
INTERNATIONAL BUILDING CODE - 2003 EDITION  
INTERNATIONAL FIRE CODE - 2003 EDITION  
UTAH STATE FIRE MARSHAL RULE R710-4  
NFPA 70 - 2002 EDITION  
NFPA 72 - 2002 EDITION
- QUALITY ASSURANCE: ALL EQUIPMENT, MATERIAL AND DEVICES LISTED AND/OR FM APPROVED FOR USE IN FIRE PROTECTION SYSTEMS. ALL INITIATING DEVICES SHALL BE LISTED COMPATIBLE WITH THE FIRE ALARM CONTROL PANEL (FACP). MAJOR SYSTEM COMPONENTS (CONTROL PANELS, INITIATING DEVICES, ADDRESSABLE MODULES AND RELAYS, POWER SUPPLIES, ETC.) SHALL BE FROM A STATE OF UTAH DFCM APPROVED MANUFACTURER. APPROVED MANUFACTURERS INCLUDE FIRE-LITE AND SILENT KNIGHT.
- SUBMITTALS: FIRE ALARM SYSTEM CONTRACTOR SHALL PREPARE AND SUBMIT SHOPS DRAWINGS TO UTAH STATE FIRE MARSHAL'S OFFICE, OWNER AND ENGINEER FOR REVIEW/APPROVAL PRIOR TO ORDERING OR INSTALLING ANY EQUIPMENT. SUBMITTALS SHALL CONFORM TO THE CONSTRUCTION DOCUMENTS REQUIREMENTS OF IFC 907.1.1.
- SYSTEM TYPE: FIRE ALARM SYSTEM SHALL MEET THE REQUIREMENTS FOR PROTECTED PREMISE FIRE ALARM SYSTEMS. SYSTEM SHALL PROVIDE OFF-PREMISE NOTIFICATION OF STATUS TO CENTRAL STATION DETERMINED BY OWNER. PROVIDE A SINGLE FACP FOR ALL 4 BUILDINGS. EXTEND SLC FROM ONE BUILDING TO THE NEXT VIA EXISTING UNDERGROUND CONDUIT (COORDINATE WITH OWNER). TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATIONS. PROVIDE CIRCUIT EXTENDERS/BOOSTERS AS REQUIRED. PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSION ON ALL CIRCUITS WHERE THEY ENTER OR LEAVE A BUILDING.
- OCCUPANT NOTIFICATION: NOTIFICATION CIRCUITS SHALL BE ZONED WITH ONE ZONE PER BUILDING. PROVIDE REMOTE NOTIFICATION POWER SUPPLIES IN EACH BUILDING TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONFIGURE NOTIFICATION CIRCUITS IN EACH BUILDING TO ACTIVATE ONLY UPON FIRE ALARM SIGNAL.
- WIRING/CONDUIT: ALL WIRING TO BE FREE OF OPENS, SHORTS AND GROUNDS. INSTALL ALL WIRING IN MINIMUM 1/2" RIGID CONDUIT, EMT, RED MC. CONDUIT INSTALLATION SHALL CONFORM TO ALL APPLICABLE REQUIREMENTS OF NEC (NFPA 70) AND DFCM STANDARDS. ALL CONDUIT PENETRATIONS THROUGH RATED PARTITIONS SHALL BE FIRE STOPPED WITH A SUITABLE CAULKING COMPOUND. ALL WIRING USED IN THE FIRE ALARM SYSTEM SHALL BE TPL (FIRE POWER LIMITED) WITH 300 V INSULATION OR EQUIVALENT AS PER NFPA 70 ARTICLE 760.
- INITIATING DEVICES: INITIATING DEVICES SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE D CIRCUITS. SIGNALING LINE CIRCUITS SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE 6 OR 7 CIRCUITS. NOTIFICATION APPLIANCE CIRCUITS SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE Z.
- POWER: INSTALL NEW DEDICATED BRANCH CIRCUIT PER NFPA 70 AND NFPA 72 TO PROVIDE PRIMARY POWER TO NEW FACP AND EACH REMOTE POWER SUPPLY. FURNISH A BATTERY BACKUP TO PROVIDE SECONDARY POWER SUPPLY TO FACP AND REMOTE POWER SUPPLIES. BATTERY BACKUP SHALL BE OF SUFFICIENT CAPACITY TO PROVIDE 24 HOURS OF STANDBY POWER WITH AN ADDITIONAL RESERVE TO OPERATE SYSTEM FOR 5 MINUTES IN ALARM.
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- MANUAL PULL STATIONS: INSTALL PULL STATIONS AT EACH BUILDING EXIT AS SHOWN ON PLANS. MOUNT PULL STATIONS AT 48" AFF ON RECESSED JUNCTION BOXES.
- HEAT DETECTORS: PROVIDE HEAT DETECTORS WHERE SHOWN ON PLANS IN ELEVATOR EQUIPMENT ROOM AND ELEVATOR PIT. MAXIMUM SPACING FOR HEAT DETECTORS SHALL BE 50' BETWEEN DETECTORS OR 25' FROM FURTHEST WALL.
- ADDRESSABLE MODULES: PROVIDE ADDRESSABLE MODULES WITH EXTERNALLY VISIBLE LED TO MONITOR CONVENTIONAL DEVICES (WATER FLOW SWITCHES, VALVE TAMPER SWITCHES, ETC.). LOCATE MONITOR MODULE ADJACENT TO FLOW OR TAMPER SWITCH IN AN ACCESSIBLE LOCATION. LABEL AS PART OF THE FIRE ALARM SYSTEM WITH THE NAME OF THE DEVICE. MONITORED ON THE COVER OF THE JUNCTION BOX.
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- FIRE SAFETY FUNCTIONS:  
ELEVATOR RECALL: CONTROL MODULES WITH RELAY CONTACTS SHALL BE INSTALLED AND PROGRAMMED TO PROVIDE ELEVATOR RECALL AND ELEVATOR POWER SHUNT TRIP. THE CONTROL RELAY MODULES SHALL BE INSTALLED WITHIN 36" OF DEVICE OR CIRCUIT CONTROLLED. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY NUMBER AND LOCATION OF DEVICES TO BE CONTROLLED.  
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- TESTING: SCHEDULE AND PERFORM ALL ACCEPTANCE TESTS REQUIRED BY NFPA 72. TESTING SHALL BE WITNESSED BY UTAH STATE FIRE MARSHAL'S OFFICE, PROJECT ENGINEER, DFCM AND BUILDING MAINTENANCE PERSONNEL. SUBMIT A WRITTEN TESTING PLAN DETAILING EACH TEST TO BE PERFORMED TO EACH AGENCY AT LEAST THREE DAYS PRIOR TO SCHEDULED TEST.
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FIRE ALARM SYSTEM KEY NOTES

- FURNISH AND INSTALL NEW ADDRESSABLE FIRE ALARM CONTROL PANEL (FACP) FOR UDOT REGION 3 COMPLEX (4 BUILDINGS). INSTALL FACP IN ADMINISTRATION BUILDING AND EXTEND SIGNALING LINE CIRCUIT BETWEEN BUILDINGS USING EXISTING UNDERGROUND CONDUIT PROVIDED BY OWNER (WIRE BY CONTRACTOR). FACP SHALL BE SILENT KNIGHT 5820 XL OR FIRE-LITE MS-9600 WITH DACT-UD. EXTEND PHONE LINES (PRIMARY AND SECONDARY) FROM EXISTING TELEPHONE TERMINAL BOARD TO FACP TO PROVIDE OFF-PREMISE MONITORING. INSTALL FACP CABINET RECESSED INTO WALL.
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- NEW FIRE SPRINKLER SYSTEM RISER. INSTALL ADDRESSABLE MONITOR MODULE AT EACH WATER FLOW SWITCH AND VALVE SUPERVISORY SWITCH TO FACILITATE MONITORING OF SWITCH AS AN ADDRESSABLE POINT. MONITOR MODULE SHALL MOUNT IN 4 - SQUARE JUNCTION BOX AND BE EQUIPPED WITH AN EXTERNAL LED VISIBLE FROM FLOW OR VALVE SUPERVISORY SWITCH. PROGRAM ACTIVATION OF WATER FLOW SWITCH AS AN ALARM SIGNAL AND ACTIVATION OF VALVE SUPERVISORY SWITCHES AS A SUPERVISORY SIGNAL.
- EXTEND SIGNALING LINE CIRCUITS (SLC) FROM FACP IN ADMINISTRATION BUILDING TO INITIATING DEVICES AND REMOTE NOTIFICATION CIRCUIT POWER SUPPLIES IN LABORATORY, HEAVY EQUIPMENT/PAINT STORAGE AND WAREHOUSE/SHOP BUILDINGS. INSTALL SLC IN EXISTING BURIED CONDUITS THAT RUN BETWEEN ELECTRICAL ROOM IN EACH BUILDING AND UNDERGROUND VAULT LOCATED BETWEEN ADMINISTRATION AND LABORATORY BUILDING (SEE SHEET FP-1.1). PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSORS IN ACCORDANCE WITH NFPA 70 ARTICLE 285 ON SLC AT EACH POINT THAT THE CIRCUIT ENTERS OR EXITS A BUILDING. TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER RECOMMENDATIONS. PROVIDE ADDITIONAL SLC CIRCUITS OR CIRCUIT EXTENDER/REPEATER AS REQUIRED. CABLE INSTALLED IN BURIED CONDUITS SHALL BE SUITABLE FOR INSTALLATION SUBMERGED IN WATER.
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- FURNISH AND INSTALL SMOKE DETECTORS AT EACH ELEVATOR LOBBY AND IN THE ELEVATOR EQUIPMENT ROOM TO PROVIDE ELEVATOR RECALL FUNCTIONS IN ACCORDANCE WITH NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAYS TO INTERFACE WITH ELEVATOR CONTROLS AND PROGRAM RECALL FUNCTIONS AS FOLLOWS:  
1. OPERATION OF SMOKE DETECTOR 2ND FLOOR LOBBY AND ELEVATOR EQUIPMENT ROOM - ELEVATOR RECALL 1ST FLOOR.  
2. OPERATION OF SMOKE DETECTOR 1ST FLOOR LOBBY - ELEVATOR RECALL TO 2ND FLOOR. CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL HEAT DETECTORS ADJACENT TO FIRE SPRINKLERS IN ELEVATOR PIT AND ELEVATOR MACHINE ROOM. HEAT DETECTORS SHALL CONFORM TO NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAY AND SHUNT TRIP BREAKER TO DISCONNECT POWER TO ELEVATOR EQUIPMENT UPON OPERATION OF EITHER HEAT DETECTOR. CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL ADDRESSABLE RELAY TO PROVIDE ACTUATION OF FIRE/SMOKE DAMPERS. RELAY SHALL BE NORMALLY ENERGIZED AND RATED FOR VOLTAGE AND CURRENT REQUIRED FOR DAMPER ACTUATION.
- PROVIDE PROGRAMABLE RELAY TO RELEASE EXISTING DOOR HOLD-OPEN DEVICES ON EXISTING FIRE DOORS. RELAY SHALL RELEASE DOORS UPON RECEIPT OF ANY FIRE ALARM SIGNAL AT FACP. POWER TO DOOR HOLD-OPEN DEVICES SHALL BE PROVIDED BY FACP.

FIRE ALARM EQUIPMENT LEGEND

DEVICE	DESCRIPTION	MOUNTING	REMARKS
FACP	FIRE ALARM CONTROL PANEL	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	SILENT KNIGHT MODEL 5820XL OR FIRE-LITE MODEL MS-9600 WITH DACT-UD.
ANN	FIRE ALARM ANNUNCIATOR PANEL	WALL MOUNT ON RECESSED J-BOX AT 54" AFF.	KEY PAD WITH ALPHANUMERIC (MINIMUM 80 CHARACTERS) WITH INPUT KEYS TO ALLOW SYSTEM RESET AND ALARM SILENCE.
NAC-PS	REMOTE POWER SUPPLIES FOR NOTIFICATION APPLIANCE CIRCUITS	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONTROLLED BY ADDRESSABLE RELAY ON SIGNALING LINE CIRCUIT.
SD	ADDRESSABLE SMOKE DETECTOR	CEILING MOUNT ON RECESSED J-BOX.	INSTALL ON CEILING IN ALL CORRIDORS, LOBBIES AND ABOVE FIRE ALARM CONTROL EQUIPMENT AS INDICATED ON PLANS.
HT	ADDRESSABLE HEAT DETECTOR	SURFACE MOUNT ON J-BOX WITHIN 24" OF FIRE SPRINKLER.	TO PROVIDE POWER DISCONNECT TO ELEVATOR PRIOR TO OPERATION OF ADJACENT SPRINKLER.
PS	ADDRESSABLE PULL STATION	WALL MOUNT AT 48" AFF ON RECESSED J-BOX. SHALL BE CONCEALED IN WALL.	INSTALL AT EACH EXIT DOOR AS INDICATED ON PLANS.
M	ADDRESSABLE MONITOR MODULE	MOUNT ON 4-SQUARE J-BOX NEAR CONVENTIONAL DEVICE TO BE MONITORED.	TO FACILITATE MONITORING OF CONTACTS OF CONVENTIONAL INITIATING DEVICES AS AN ADDRESSABLE POINT.
C	ADDRESSABLE CONTROL MODULE	MOUNT ON 4 - SQUARE J-BOX WITHIN 3' OF DEVICE OR CIRCUIT CONTROLLED.	FOR PROTECTED PREMISE FIRE SAFETY FUNCTIONS (ELEVATOR RECALL AND NAC ACTIVATION).
WFS	WATER FLOW SWITCH	FIRE SPRINKLER RISER.	TO DETECT WATER FLOW IN FIRE SPRINKLER SYSTEM.
VS	VALVE SUPERVISORY SWITCH	FIRE SPRINKLER CONTROL VALVES.	TO MONITOR POSITION OF CONTROL VALVES.
FS	FIRE ALARM STROBE	WALL MOUNT AT 80" AFF OR CEILING MOUNT ON RECESSED J-BOX.	STROBE SHALL HAVE A MINIMUM CANDELA RATING OF 150cd INTENSITY SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW.
H	FIRE ALARM HORN/STROBE (WALL)	WALL MOUNT AT 80" AFF ON RECESSED J-BOX.	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
H	FIRE ALARM HORN/STROBE (CEILING)	CEILING MOUNTED ON RECESSED J-BOX.	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
EH	EXTERIOR FIRE ALARM HORN	WALL MOUNT AT 10'-0" AFF ON WEATHER PROOF BACK BOX.	EXTERIOR ALARM. SET HORN VOLUME TO MAXIMUM LEVEL.
FD	FIRE/SMOKE DAMPER	EXISTING	PROVIDE ADDRESSABLE MODULE FOR CONTROL.
MC	MAGNETIC CONTACT DOOR HOLDER	EXISTING	PROVIDE CONTINUOUS 24 VDC POWER FROM FACP TO DOOR HOLDER. PROVIDE CONTROL MODULE AND PROGRAM TO DISCONNECT POWER AND RELEASE DOORS UPON RECEIPT OF FIRE ALARM SIGNAL.

UDOT REGION 3  
PROVO, UTAH

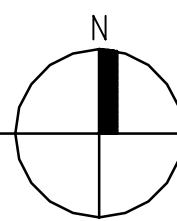
FIRE ALARM SYSTEM PLAN - HEAVY EQUIPMENT/PAINT STORAGE BUILDING  
FP-3.5

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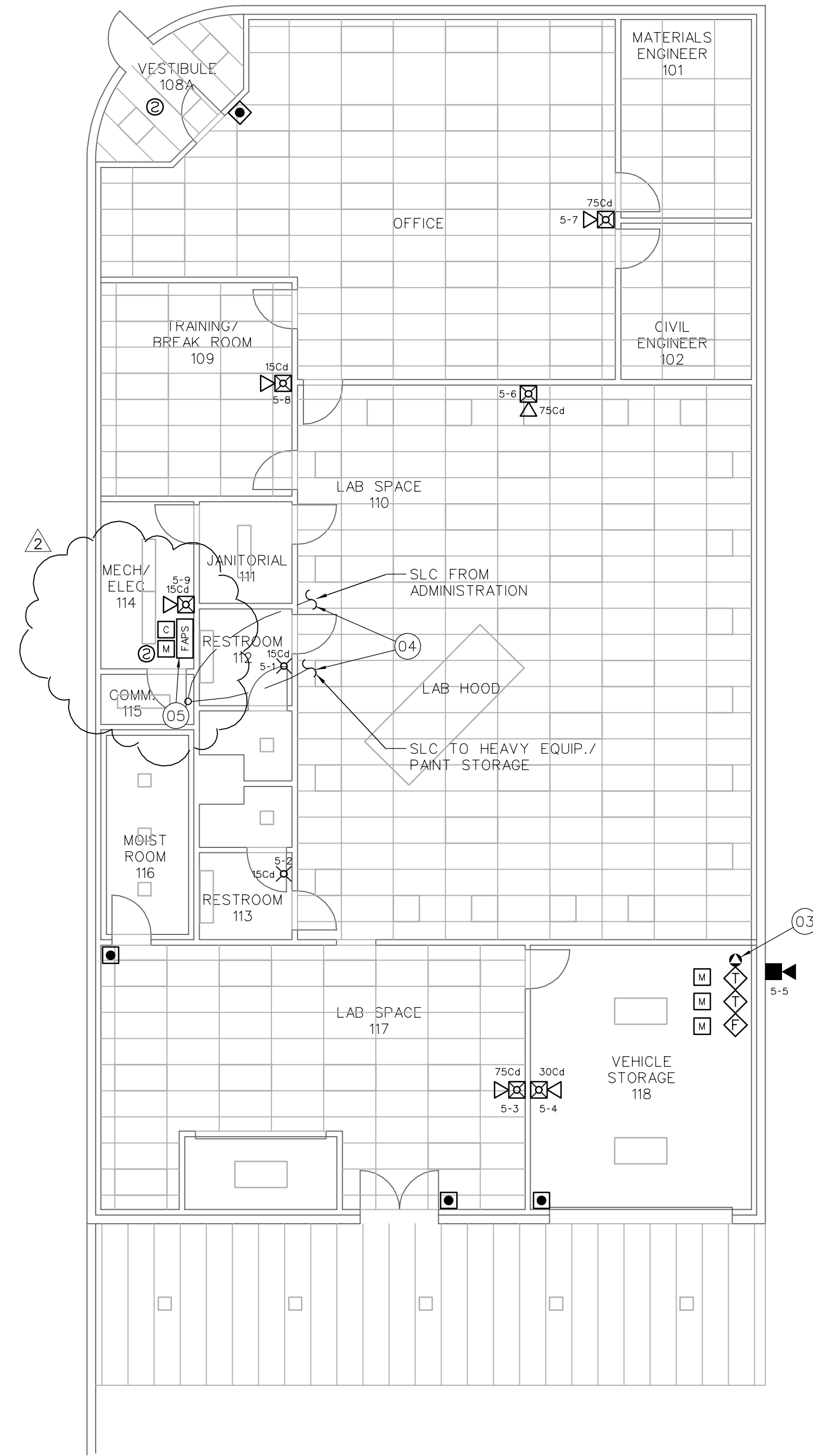
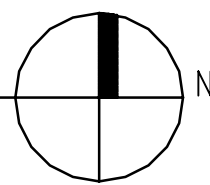


## FP-3.4



FIRE ALARM SYSTEM PLAN – LABORATORY BUILDING

1/8" = 1'-0"



FIRE ALARM SYSTEM GENERAL NOTES

- SCOPE OF WORK: WORK SHALL INCLUDE INSTALLATION OF NEW ADDRESSABLE FIRE ALARM SYSTEM INCLUDING ALL CONTROL EQUIPMENT, POWER SUPPLIES, INITIATING CIRCUITS AND DEVICES, NOTIFICATION APPLIANCE CIRCUITS AND DEVICES REQUIRED TO CONSTITUTE A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM THROUGHOUT BUILDING IN ACCORDANCE WITH NFPA 72, IBC, IFC THESE DRAWINGS AND PROJECT SPECIFICATIONS.
- APPLICABLE CODES/STANDARDS: INTERNATIONAL BUILDING CODE - 2003 EDITION INTERNATIONAL FIRE CODE - 2003 EDITION UTAH STATE FIRE MARSHAL RULE R710-4 NFPA 70 - 2002 EDITION NFPA 72 - 2002 EDITION
- QUALITY ASSURANCE: ALL EQUIPMENT, MATERIAL AND DEVICES LISTED AND/OR FM APPROVED FOR USE IN FIRE PROTECTION SYSTEMS. ALL INITIATING DEVICES SHALL BE LISTED COMPATIBLE WITH THE FIRE ALARM CONTROL PANEL (FACP). MAJOR SYSTEM COMPONENTS (CONTROL PANELS, INITIATING DEVICES, ADDRESSABLE MODULES, AND RELAYS, POWER SUPPLIES, ETC.) SHALL BE FROM A STATE OF UTAH DFCM APPROVED MANUFACTURER. APPROVED MANUFACTURERS INCLUDE FIRE-LITE AND SILENT KNIGHT.
- SUBMITTALS: FIRE ALARM SYSTEM CONTRACTOR SHALL PREPARE AND SUBMIT SHOPS DRAWINGS TO UTAH STATE FIRE MARSHAL'S OFFICE, OWNER AND ENGINEER FOR REVIEW/APPROVAL PRIOR TO ORDERING OR INSTALLING ANY EQUIPMENT. SUBMITTALS SHALL CONFORM TO THE CONSTRUCTION DOCUMENTS REQUIREMENTS OF IFC 907.1.1.
- SYSTEM TYPE: FIRE ALARM SYSTEM SHALL MEET THE REQUIREMENTS FOR PROTECTED PREMISE FIRE ALARM SYSTEMS. SYSTEM SHALL PROVIDE OFF-PREMISE NOTIFICATION OF STATUS TO CENTRAL STATION DETERMINED BY OWNER. PROVIDE A SINGLE FACP FOR ALL 4 BUILDINGS. EXTEND SLC FROM ONE BUILDING TO THE NEXT VIA EXISTING UNDERGROUND CONDUIT (COORDINATE WITH OWNER). TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATIONS. PROVIDE CIRCUIT EXTENDERS/BOOSTERS AS REQUIRED. PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSION ON ALL CIRCUITS WHERE THEY ENTER OR LEAVE A BUILDING.
- OCCUPANT NOTIFICATION: NOTIFICATION CIRCUITS SHALL BE ZONED WITH ONE ZONE PER BUILDING. PROVIDE REMOTE NOTIFICATION POWER SUPPLIES IN EACH BUILDING TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONFIGURE NOTIFICATION CIRCUITS IN EACH BUILDING TO ACTIVATE ONLY UPON OPERATIONAL DEVICES WITHIN THE BUILDING.
- WIRING/CONDUIT: ALL WIRING TO BE FREE OF OPENS, SHORTS AND GROUNDS. INSTALL ALL WIRING IN MINIMUM 1/2" RIGID CONDUIT, EMT, RED MC. CONDUIT INSTALLATION SHALL CONFORM TO ALL APPLICABLE REQUIREMENTS OF NEC (NFPA 70) AND DFCM STANDARDS. ALL CONDUIT PENETRATIONS THROUGH RATED PARTITIONS SHALL BE FIRE STOPPED WITH A SUITABLE CAULKING COMPOUND. ALL WIRING USED IN THE FIRE ALARM SYSTEM SHALL BE TPL (FIRE POWERED) WITH 300 V INSULATION OR EQUIVALENT AS PER NFPA 70 ARTICLE 760.
- INITIATING DEVICES: INITIATING DEVICES SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE D CIRCUITS. SIGNALING LINE CIRCUITS SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE 6 OR 7 CIRCUITS. NOTIFICATION DEVICES SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE Z. SMOKE DETECTORS: PROVIDE SMOKE DETECTORS WHERE SHOWN ON PLANS IN ALL CORRIDORS, LOBBIES, ELEVATOR EQUIPMENT ROOM AND ABOVE FIRE ALARM CONTROL EQUIPMENT. MAXIMUM SPACING OF DETECTORS SHALL BE 30' BETWEEN OR 15' FROM FURTHEST WALL. MANUAL PULL STATIONS: INSTALL PULL STATIONS AT EACH BUILDING EXIT AS SHOWN ON PLANS. MOUNT PULL STATIONS AT 48" AFF ON RECESSED JUNCTION BOXES. HEAT DETECTORS: PROVIDE HEAT DETECTORS WHERE SHOWN ON PLANS IN ELEVATOR EQUIPMENT ROOM AND ELEVATOR PIT. MAXIMUM SPACING FOR HEAT DETECTORS SHALL BE 50' BETWEEN DETECTORS OR 25' FROM FURTHEST WALL. ADDRESSABLE MODULES: PROVIDE ADDRESSABLE MODULES WITH EXTERNALLY VISIBLE LED TO MONITOR CONVENTIONAL DEVICES (WATER FLOW SWITCHES, VALVE TAMPER SWITCHES, ETC.). LOCATE MONITOR MODULE ADJACENT TO FLOW OR TAMPER SWITCH IN AN ACCESSIBLE LOCATION. LABEL AS PART OF THE FIRE ALARM SYSTEM WITH THE NAME OF THE DEVICE. MONITORED ON THE COVER OF THE JUNCTION BOX.
- NOTIFICATION APPLIANCES: PROVIDE AUDIBLE AND VISUAL NOTIFICATION APPLIANCES THROUGHOUT EACH BUILDING IN ACCORDANCE WITH PUBLIC MODE SIGNALING REQUIREMENTS OF NFPA 72. VOLUME OF HORNS AND SPEAKERS SHALL BE SUFFICIENT TO PROVIDE A SOUND LEVEL OF 15 DB ABOVE AMBIENT IN ALL OCCUPIED AREAS. VISIBLE ALARMS SHALL BE PROVIDED THROUGHOUT ALL PUBLIC AREAS OF THE BUILDING AS WELL AS PRIVATE OFFICES AND AREAS WITH POSSIBLE OCCUPANCY BY HEARING IMPAIRED PERSONS. PROVIDE SYNCHRONIZATION OF STROBE FLASHES.
- FIRE SAFETY FUNCTIONS: ELEVATOR RECALL: CONTROL MODULES WITH RELAY CONTACTS SHALL BE INSTALLED AND PROGRAMMED TO PROVIDE ELEVATOR RECALL AND ELEVATOR POWER SHUNT TRIP. THE CONTROL RELAY MODULES SHALL BE INSTALLED WITHIN 36" OF DEVICE OR CIRCUIT CONTROLLED. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY NUMBER AND LOCATION OF DEVICES TO BE CONTROLLED. FIRE/SMOKE DAMPERS: PROVIDE CONTROL MODULES WITH RELAY CONTACTS TO RELEASE ALL EXISTING FIRE/SMOKE DAMPERS. INSTALL MODULE WITH 36" OF DAMPER OR POWER CIRCUIT TO DAMPER MODULE SHALL BE LISTED FOR VOLTAGE AND CURRENT REQUIRED TO OPERATE DAMPERS. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY NUMBER AND LOCATION OF DAMPERS TO BE CONTROLLED.
- TESTING: SCHEDULE AND PERFORM ALL ACCEPTANCE TESTS REQUIRED BY NFPA 72. TESTING SHALL BE WITNESSED BY UTAH STATE FIRE MARSHAL'S OFFICE, PROJECT ENGINEER, DFCM AND BUILDING MAINTENANCE PERSONNEL. SUBMIT A WRITTEN TESTING PLAN DETAILING EACH TEST TO BE PERFORMED TO EACH AGENCY AT LEAST THREE DAYS PRIOR TO SCHEDULED TEST.
- DEMOLITION: CONTRACTOR SHALL REMOVE EXISTING SYSTEM (CONTROL PANEL, POWER SUPPLY, DETECTORS, WIRING, ETC.) THAT PROVIDES ELEVATOR RECALL FUNCTIONS AND ACTIVATION OF FIRE/SMOKE DAMPERS. ELEVATOR RECALL AND DAMPER ACTUATION TO BE PROVIDED BY NEW FIRE ALARM SYSTEM.

FIRE ALARM SYSTEM KEY NOTES

- FURNISH AND INSTALL NEW ADDRESSABLE FIRE ALARM CONTROL PANEL (FACP) FOR UDOT REGION 3 COMPLEX (4 BUILDINGS). INSTALL FACP IN ADMINISTRATION BUILDING AND EXTEND SIGNALING LINE CIRCUIT BETWEEN BUILDINGS USING EXISTING UNDERGROUND CONDUIT PROVIDED BY OWNER (WIRE BY CONTRACTOR). FACP SHALL BE SILENT KNIGHT 5820 XL OR FIRE-LITE MS-9600 WITH DACT-UD. EXTEND PHONE LINES (PRIMARY AND SECONDARY) FROM EXISTING TELEPHONE TERMINAL BOARD TO FACP TO PROVIDE OFF-PREMISE MONITORING. INSTALL FACP CABINET RECESSED INTO WALL.
- FURNISH AND INSTALL NEW REMOTE ANNUNCIATOR PANEL (KEYPAD WITH ALPHANUMERIC READ OUT) FOR FIRE ALARM SYSTEM. LOCATE ANNUNCIATOR NEAR MAIN ENTRANCE OF ADMINISTRATION BUILDING AS SHOWN ON PLANS. LOCATION OF ANNUNCIATOR PANEL MAY BE ADJUSTED BY CONTRACTOR TO FACILITATE INSTALLATION BUT THE PANEL SHALL BE VISIBLE FROM THE MAIN ENTRANCE DOORS TO THE BUILDING. WALL MOUNT ANNUNCIATOR AT 54" AFF. ANNUNCIATOR SHALL BE MOUNTED ON RECESSED TYPE JUNCTION BOX AND CONDUIT TO BOX SHALL BE CONCEALED IN WALL.
- NEW FIRE SPRINKLER SYSTEM RISER. INSTALL ADDRESSABLE MONITOR MODULE AT EACH WATER FLOW SWITCH AND VALVE SUPERVISORY SWITCH TO FACILITATE MONITORING OF SWITCH AS AN ADDRESSABLE POINT. MONITOR MODULE SHALL MOUNT IN 4" SQUARE JUNCTION BOX AND BE EQUIPPED WITH AN EXTERNAL LED VISIBLE FROM FLOW OR VALVE SUPERVISORY SWITCH. PROGRAM ACTIVATION OF WATER FLOW SWITCH AS AN ALARM SIGNAL AND ACTIVATION OF VALVE SUPERVISORY SWITCHES AS A SUPERVISORY SIGNAL.
- EXTEND SIGNALING LINE CIRCUIT(S) (SLO) FROM FACP IN ADMINISTRATION BUILDING TO INITIATING DEVICES AND REMOTE NOTIFICATION CIRCUIT. POWER SUPPLIES IN LABORATORY, HEAVY EQUIPMENT/PAINT STORAGE AND WAREHOUSE/SHOP BUILDINGS. INSTALL SLC IN EXISTING BURIED CONDUITS THAT RUN BETWEEN ELECTRICAL ROOM IN EACH BUILDING AND UNDERGROUND VAULT LOCATED BETWEEN ADMINISTRATION AND LABORATORY BUILDING (SEE SHEET FP-11). PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSORS IN ACCORDANCE WITH NFPA 70 ARTICLE 285 ON SLC AT EACH POINT THAT THE CIRCUIT ENTERS OR EXITS A BUILDING. TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER RECOMMENDATIONS. PROVIDE ADDITIONAL SLC CIRCUITS OR CIRCUIT EXTENDER/REPEATER AS REQUIRED. CABLE INSTALLED IN BURIED CONDUITS SHALL BE SUITABLE FOR INSTALLATION SUBMERGED IN WATER.
- FURNISH AND INSTALL A REMOTE POWER SUPPLY TO POWER NOTIFICATION APPLIANCE CIRCUITS (NAC) FOR THE LABORATORY, HEAVY EQUIPMENT/PAINT STORAGE AND WAREHOUSE/SHOP BUILDINGS. PROVIDE AN ADDRESSABLE RELAY MODULE TO ACTIVATE NAC CIRCUITS UPON OPERATION OF INITIATING DEVICES IN THAT BUILDING ONLY. PROVIDE AN ADDRESSABLE MONITOR MODULE TO SUPERVISE TROUBLE CONTACTS OF REMOTE POWER SUPPLY. INSTALL BATTERIES TO PROVIDE SECONDARY POWER SUPPLY FOR 24 HOURS IN STANDBY AND 5 MINUTES IN ALARM. LAYOUT OF NAC CIRCUITS SHALL LIMIT VOLTAGE DROP BETWEEN POWER SUPPLY AND MOST REMOTE APPLIANCE TO LESS THAN 20V. PROVIDE MODULE AS REQUIRED TO SYNCHRONIZE STROBE FLASHES OF ALL NOTIFICATION APPLIANCES WITHIN A SINGLE FIELD OF VIEW. LOCATION OF REMOTE POWER SUPPLY MAY BE ADJUSTED IN FIELD AS REQUIRED TO COORDINATE WITH EXISTING BUILDING SYSTEMS AND EQUIPMENT.
- FURNISH AND INSTALL SMOKE DETECTORS AT EACH ELEVATOR LOBBY AND IN THE ELEVATOR EQUIPMENT ROOM TO PROVIDE ELEVATOR RECALL FUNCTIONS IN ACCORDANCE WITH NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAYS TO INTERFACE WITH ELEVATOR CONTROLS AND PROGRAM RECALL FUNCTIONS AS FOLLOWS:
  - OPERATION OF SMOKE DETECTOR 2ND FLOOR LOBBY AND ELEVATOR EQUIPMENT ROOM - ELEVATOR RECALL TO 1ST FLOOR
  - OPERATION OF SMOKE DETECTOR 1ST FLOOR LOBBY - ELEVATOR RECALL TO 2ND FLOOR.CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL HEAT DETECTORS ADJACENT TO FIRE SPRINKLERS IN ELEVATOR PIT AND ELEVATOR MACHINE ROOM. HEAT DETECTORS SHALL CONFORM TO NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAY AND SHUNT TRIP BREAKER TO DISCONNECT POWER TO ELEVATOR EQUIPMENT UPON OPERATION OF EITHER HEAT DETECTOR. CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL ADDRESSABLE RELAY TO PROVIDE ACTUATION OF FIRE/SMOKE DAMPERS. RELAY SHALL BE NORMALLY ENERGIZED AND RATED FOR VOLTAGE AND CURRENT REQUIRED FOR DAMPER ACTUATION.
- PROVIDE PROGRAMMABLE RELAY TO RELEASE EXISTING DOOR HOLD-OPEN DEVICES ON EXISTING FIRE DOORS. RELAY SHALL RELEASE DOORS UPON RECEIPT OF ANY FIRE ALARM SIGNAL AT FACP. POWER TO DOOR HOLD-OPEN DEVICES SHALL BE PROVIDED BY FACP.

FIRE ALARM EQUIPMENT LEGEND

DEVICE	DESCRIPTION	MOUNTING	REMARKS
FACP	FIRE ALARM CONTROL PANEL	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	SILENT KNIGHT MODEL 5820XL OR FIRE-LITE MODEL MS-9600 WITH DACT-UD
ANN	FIRE ALARM ANNUNCIATOR PANEL	WALL MOUNT ON RECESSED J-BOX AT 54" AFF	KEY PAD WITH ALPHANUMERIC (MINIMUM 80 CHARACTERS) WITH RECALL KEYS TO ALLOW SYSTEM RESET AND ALARM SILENCE.
NAC-PS	REMOTE POWER SUPPLIES FOR NOTIFICATION APPLIANCE CIRCUITS	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONTROLLED BY ADDRESSABLE RELAY ON SIGNALING LINE CIRCUIT.
⊙	ADDRESSABLE SMOKE DETECTOR	CEILING MOUNT ON RECESSED J-BOX.	INSTALL ON CEILING IN ALL CORRIDORS, LOBBIES AND ABOVE FIRE ALARM CONTROL EQUIPMENT AS INDICATED ON PLANS.
H	ADDRESSABLE HEAT DETECTOR	SURFACE MOUNT ON J-BOX WITHIN 24" OF FIRE SPRINKLER	TO PROVIDE POWER DISCONNECT TO ELEVATOR PRIOR TO OPERATION OF ADJACENT SPRINKLER.
■	ADDRESSABLE PULL STATION	WALL MOUNT AT 48" AFF ON RECESSED J-BOX. CONDUIT SHALL BE CONCEALED IN WALL.	INSTALL AT EACH EXIT DOOR AS INDICATED ON PLANS.
M	ADDRESSABLE MONITOR MODULE	MOUNT ON 4" SQUARE J-BOX NEAR CONVENTIONAL DEVICE TO BE MONITORED.	TO FACILITATE MONITORING OF CONTACTS OF CONVENTIONAL INITIATING DEVICES AS AN ADDRESSABLE POINT.
□	ADDRESSABLE CONTROL MODULE	MOUNT ON 4" SQUARE J-BOX WITHIN 3' OF DEVICE OR CIRCUIT CONTROLLED	FOR PROTECTED PREMISE FIRE SAFETY FUNCTIONS (ELEVATOR RECALL AND NAC ACTIVATION)
◇	WATER FLOW SWITCH	FIRE SPRINKLER RISER	TO DETECT WATER FLOW IN FIRE SPRINKLER SYSTEM
◇	VALVE SUPERVISORY SWITCH	FIRE SPRINKLER CONTROL VALVES	TO MONITOR POSITION OF CONTROL VALVES.
⊗	FIRE ALARM STROBE	WALL MOUNT AT 80" AFF OR CEILING MOUNT ON RECESSED J-BOX	STROBE SHALL HAVE A MINIMUM CANDELA RATING OF 1500. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW.
⊗	FIRE ALARM HORN/STROBE (WALL)	WALL MOUNT AT 80" AFF ON RECESSED J-BOX	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
⊗	FIRE ALARM HORN/STROBE (CEILING)	CEILING MOUNTED ON RECESSED J-BOX	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
⬇	EXTERIOR FIRE ALARM HORN	WALL MOUNT AT 10'-0" AFF ON WEATHER PROOF BOX BOX	EXTERIOR ALARM. SET HORN VOLUME TO MAXIMUM LEVEL.
⬆	FIRE/SMOKE DAMPER	EXISTING	PROVIDE ADDRESSABLE MODULE FOR CONTROL.
◇	MAGNETIC CONTACT DOOR HOLDER	EXISTING	PROVIDE CONTINUOUS 24 VDC POWER FROM FACP TO DOOR HOLDER. PROVIDE CONTROL MODULE AND PROGRAM TO DISCONNECT POWER AND RELEASE DOORS UPON RECEIPT OF FIRE ALARM SIGNAL.

UDOT REGION 3  
PROVO, UTAH

FIRE ALARM SYSTEM UPGRADES  
DFCM PROJECT #05233900

FIRE ALARM  
SYSTEM PLAN  
LABORATORY  
BUILDING  
FP-3.3

JOB NO. 103991  
DWG ISSUE: ADENDUM #2

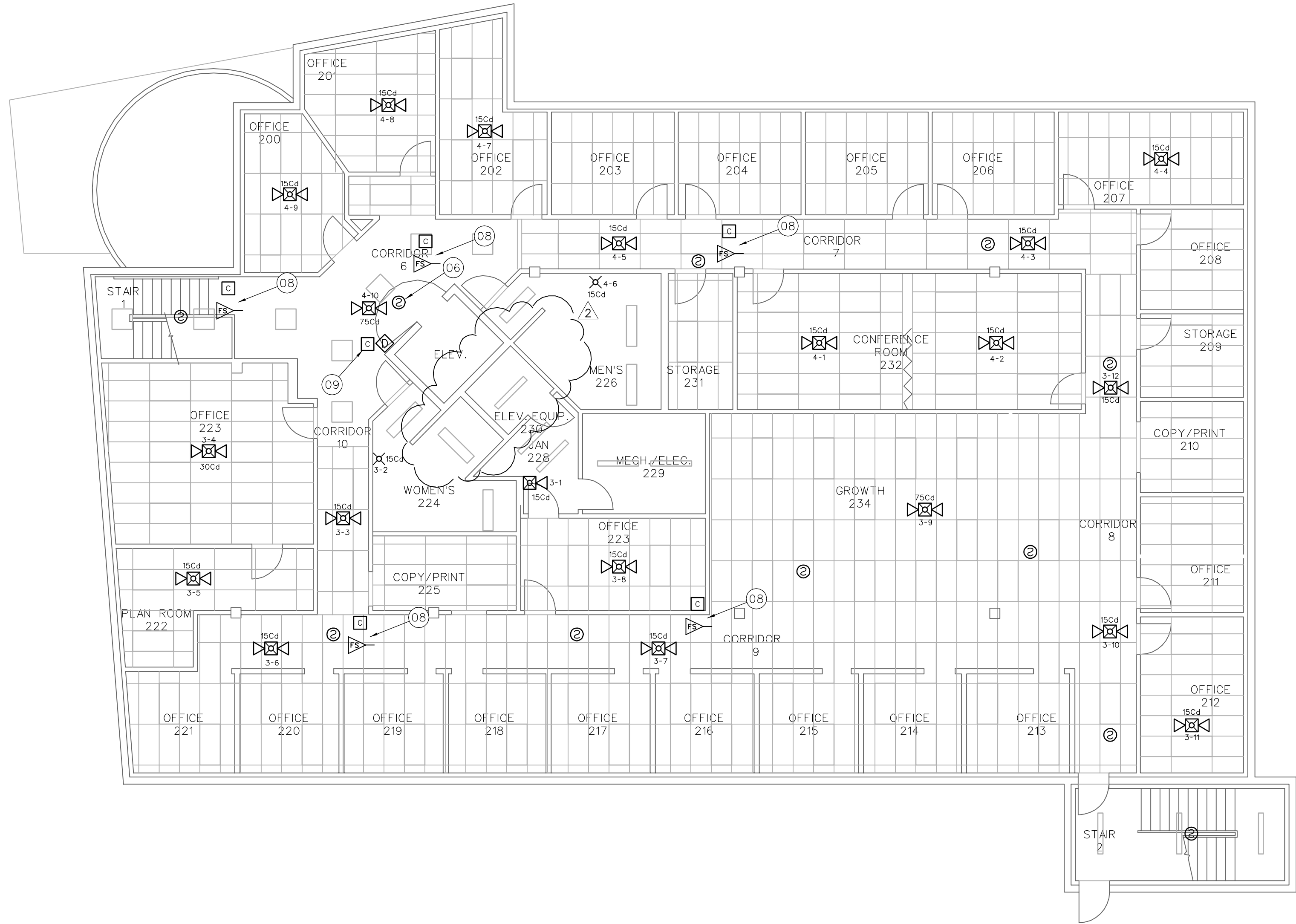
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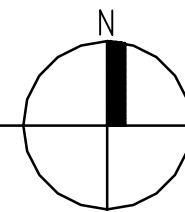
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FIRE ALARM SYSTEM PLAN – ADMINISTRATION BUILDING LEVEL 2

1/8" = 1'-0"



FIRE ALARM SYSTEM GENERAL NOTES

- SCOPE OF WORK: WORK SHALL INCLUDE INSTALLATION OF NEW ADDRESSABLE FIRE ALARM SYSTEM INCLUDING ALL CONTROL EQUIPMENT, POWER SUPPLIES, INITIATING DEVICES AND DEVICES, NOTIFICATION APPLIANCE CIRCUITS AND DEVICES REQUIRED TO CONSTITUTE A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM THROUGHOUT BUILDING IN ACCORDANCE WITH NFPA 72, IBC, IFC THESE DRAWINGS AND PROJECT SPECIFICATIONS.
- APPLICABLE CODES/STANDARDS:  
INTERNATIONAL BUILDING CODE - 2003 EDITION  
INTERNATIONAL FIRE CODE - 2003 EDITION  
UTAH STATE FIRE MARSHAL RULE R710-4  
NFPA 70 - 2002 EDITION  
NFPA 72 - 2002 EDITION
- QUALITY ASSURANCE: ALL EQUIPMENT, MATERIAL, AND DEVICES USED FOR THE FIRE ALARM SYSTEM INSTALLATION SHALL BE UL LISTED AND/OR FM APPROVED FOR USE IN FIRE PROTECTION SYSTEMS. ALL INITIATING DEVICES SHALL BE LISTED COMPATIBLE WITH THE FIRE ALARM CONTROL PANEL (FACP). MAJOR SYSTEM COMPONENTS (CONTROL PANELS, INITIATING DEVICES, ADDRESSABLE MODULES, AND RELAYS, POWER SUPPLIES, ETC.) SHALL BE FROM A STATE OF UTAH DFCM APPROVED MANUFACTURER. APPROVED MANUFACTURERS INCLUDE FIRE-LITE AND SILENT KNIGHT.
- SUBMITTALS: FIRE ALARM SYSTEM CONTRACTOR SHALL PREPARE AND SUBMIT SHOPS DRAWINGS TO UTAH STATE FIRE MARSHAL'S OFFICE, OWNER AND ENGINEER FOR REVIEW/APPROVAL PRIOR TO ORDERING OR INSTALLING ANY EQUIPMENT. SUBMITTALS SHALL CONFORM TO THE CONSTRUCTION DOCUMENTS REQUIREMENTS OF IFC 907.1.1.
- SYSTEM TYPE: FIRE ALARM SYSTEM SHALL MEET THE REQUIREMENTS FOR PROTECTED PREMISE FIRE ALARM SYSTEMS. SYSTEM SHALL PROVIDE OFF-PREMISE NOTIFICATION OF STATUS TO CENTRAL STATION DETERMINED BY OWNER. PROVIDE A SINGLE FACP FOR ALL 4 BUILDINGS. EXTEND SLC FROM ONE BUILDING TO THE NEXT VIA EXISTING UNDERGROUND CONDUIT (COORDINATE WITH OWNER). TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATIONS. PROVIDE CIRCUIT EXTENDERS/BOOSTERS AS REQUIRED. PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSION ON ALL CIRCUITS WHERE THEY ENTER OR LEAVE A BUILDING.
- OCCUPANT NOTIFICATION: NOTIFICATION CIRCUITS SHALL BE ZONED WITH ONE ZONE PER BUILDING. PROVIDE REMOTE NOTIFICATION POWER SUPPLIES IN EACH BUILDING TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONFIGURE NOTIFICATION CIRCUITS IN EACH BUILDING TO ACTIVATE ONLY UPON FIRE ALARM DEVICE OPERATION.
- WIRING/CONDUIT: ALL WIRING TO BE FREE OF OPENS, SHORTS AND GROUNDS. INSTALL ALL WIRING IN MINIMUM 1/2" RIGID CONDUIT, EMT, RED MC. CONDUIT INSTALLATION SHALL CONFORM TO ALL APPLICABLE REQUIREMENTS OF NFPA 70 AND DFCM STANDARDS. ALL CONDUIT PENETRATIONS THROUGH RATED PARTITIONS SHALL BE FIRE STOPPED WITH A SUITABLE CAULKING COMPOUND. ALL WIRING USED IN THE FIRE ALARM SYSTEM SHALL BE TPL (FIRE POWER LIMITED) WITH 300 V INSULATION OR EQUIVALENT AS PER NFPA 70 ARTICLE 760.
- WIRING SLEEPER NFPA 72: INITIATING DEVICE CIRCUITS SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE D CIRCUITS. SIGNALING LINE CIRCUITS SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE 6 OR 7 CIRCUITS. NOTIFICATION APPLIANCE CIRCUITS SHALL MEET THE REQUIREMENTS FOR CLASS A STYLE Z.
- POWER: INSTALL NEW DEDICATED BRANCH CIRCUIT PER NFPA 70 AND NFPA 72 TO PROVIDE PRIMARY POWER TO NEW FACP AND EACH REMOTE POWER SUPPLY. FURNISH A BATTERY BACKUP TO PROVIDE SECONDARY POWER SUPPLY TO FACP AND REMOTE POWER SUPPLIES. BATTERY BACKUP SHALL BE OF SUFFICIENT CAPACITY TO PROVIDE 24 HOURS OF STANDBY POWER WITH AN ADDITIONAL RESERVE TO OPERATE SYSTEM FOR 5 MINUTES IN ALARM.
- INITIATING DEVICES: SLC LOOP DEVICE ADDRESSING SHALL NOT EXCEED 127 DETECTORS (SMOKES, HEAT, DUCT, SMOKE, ETC.) OR 127 MODULES (PULL STATIONS, MONITOR, CONTROL, ETC.) PER LOOP. AT LEAST 19 ADDRESSES (15Z) SHOULD BE LEFT VACANT ON EACH SLC LOOP IN ORDER TO ALLOW SPACE FOR ADJUSTMENTS.  
SMOKE DETECTORS: PROVIDE SMOKE DETECTORS WHERE SHOWN ON PLANS IN ALL CORRIDORS, LOBBIES, ELEVATOR EQUIPMENT ROOM AND ABOVE FIRE ALARM CONTROL EQUIPMENT. MAXIMUM SPACING OF DETECTORS SHALL BE 30' BETWEEN OR 15' FROM FURTHEST WALL.  
MANUAL PULL STATIONS: INSTALL PULL STATIONS AT EACH BUILDING EXIT AS SHOWN ON PLANS. MOUNT PULL STATIONS AT 48" AFF ON RECESSED JUNCTION BOXES.  
HEAT DETECTORS: PROVIDE HEAT DETECTORS WHERE SHOWN ON PLANS IN ELEVATOR EQUIPMENT ROOM AND ELEVATOR PIT. MAXIMUM SPACING FOR HEAT DETECTORS SHALL BE 50' BETWEEN DETECTORS OR 25' FROM FURTHEST WALL.
- ADDRESSABLE MODULES: PROVIDE ADDRESSABLE MODULES WITH EXTERNALLY VISIBLE LED TO MONITOR CONVENTIONAL DEVICES (WATER FLOW SWITCHES, VALVE TAMPER SWITCHES, ETC.). LOCATE MONITOR MODULE ADJACENT TO FLOW OR TAMPER SWITCH IN AN ACCESSIBLE LOCATION. LABEL AS PART OF THE FIRE ALARM SYSTEM WITH THE NAME OF THE DEVICE. MONITORED ON THE COVER OF THE JUNCTION BOX.
- NOTIFICATION APPLIANCES: PROVIDE AUDIBLE AND VISUAL NOTIFICATION APPLIANCES THROUGHOUT EACH BUILDING IN ACCORDANCE WITH PUBLIC MODE SIGNALING REQUIREMENTS OF NFPA 72. VOLUME OF HORNS AND SPEAKERS SHALL BE SUFFICIENT TO PROVIDE A SOUND LEVEL OF 15 DB ABOVE AMBIENT IN ALL OCCUPIED AREAS. VISIBLE ALARMS SHALL BE PROVIDED THROUGHOUT ALL PUBLIC AREAS OF THE BUILDING AS WELL AS PRIVATE OFFICES AND AREAS WITH POSSIBLE OCCUPANCY BY HEARING IMPAIRED PERSONS. PROVIDE SYNCHRONIZATION OF STROBE FLASHES.
- FIRE SAFETY FUNCTIONS:  
ELEVATOR RECALL: CONTROL MODULES WITH RELAY CONTACTS SHALL BE INSTALLED AND PROGRAMMED TO PROVIDE ELEVATOR RECALL AND ELEVATOR POWER SHUNT TRIP. THE CONTROL RELAY MODULES SHALL BE INSTALLED WITHIN 36" OF DEVICE OR CIRCUIT CONTROLLED. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY NUMBER AND LOCATION OF DEVICES TO BE CONTROLLED.  
FIRE/SMOKE DAMPERS: PROVIDE CONTROL MODULES WITH RELAY CONTACTS TO RELEASE ALL EXISTING FIRE/SMOKE DAMPERS. INSTALL MODULE WITH 36" OF DAMPER OR POWER CIRCUIT TO DAMPER MODULE SHALL BE LISTED FOR VOLTAGE AND CURRENT REQUIRED TO OPERATE DAMPERS. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY NUMBER AND LOCATION OF DAMPERS TO BE CONTROLLED.
- TESTING: SCHEDULE AND PERFORM ALL ACCEPTANCE TESTS REQUIRED BY NFPA 72. TESTING SHALL BE WITNESSED BY UTAH STATE FIRE MARSHAL'S OFFICE, PROJECT ENGINEER, DFCM AND BUILDING MAINTENANCE PERSONNEL. SUBMIT A WRITTEN TESTING PLAN DETAILING EACH TEST TO BE PERFORMED TO EACH AGENCY AT LEAST THREE DAYS PRIOR TO SCHEDULED TEST.
- DEMOLITION: CONTRACTOR SHALL REMOVE EXISTING SYSTEM (CONTROL PANEL, POWER SUPPLY, DETECTORS, WIRING, ETC.) THAT PROVIDES ELEVATOR RECALL FUNCTIONS AND ACTIVATION OF FIRE/SMOKE DAMPERS. ELEVATOR RECALL AND DAMPER ACTUATION TO BE PROVIDED BY NEW FIRE ALARM SYSTEM.

FIRE ALARM SYSTEM KEY NOTES

- FURNISH AND INSTALL NEW ADDRESSABLE FIRE ALARM CONTROL PANEL (FACP) FOR UDOT REGION 3 COMPLEX (4 BUILDINGS). INSTALL FACP IN ADMINISTRATION BUILDING AND EXTEND SIGNALING LINE CIRCUIT BETWEEN BUILDINGS USING UNDERGROUND CONDUIT PROVIDED BY OWNER (WIRE BY CONTRACTOR). FACP SHALL BE SILENT KNIGHT 5820 XL OR FIRE-LITE MS-9600 WITH DACT-UD. EXTEND PHONE LINES (PRIMARY AND SECONDARY) FROM EXISTING TELEPHONE TERMINAL BOARD TO FACP TO PROVIDE OFF-PREMISE MONITORING. INSTALL FACP CABINET RECESSED INTO WALL.
- FURNISH AND INSTALL NEW REMOTE ANNUNCIATOR PANEL (KEYPAD WITH ALPHANUMERIC READ OUT) FOR FIRE ALARM SYSTEM. LOCATE ANNUNCIATOR NEAR MAIN ENTRANCE OF ADMINISTRATION BUILDING AS SHOWN ON PLANS. LOCATION OF ANNUNCIATOR PANEL MAY BE ADJUSTED BY CONTRACTOR TO FACILITATE INSTALLATION BUT THE PANEL SHALL BE VISIBLE FROM THE MAIN ENTRANCE DOORS TO THE BUILDING. WALL MOUNT ANNUNCIATOR AT 54" AFF. ANNUNCIATOR SHALL BE MOUNTED ON RECESSED TYPE JUNCTION BOX AND CONDUIT TO BOX SHALL BE CONCEALED IN WALL.
- NEW FIRE SPRINKLER SYSTEM RISER. INSTALL ADDRESSABLE MONITOR MODULE AT EACH WATER FLOW SWITCH AND VALVE SUPERVISORY SWITCH TO FACILITATE MONITORING OF SWITCH AS AN ADDRESSABLE POINT. MONITOR MODULE SHALL MOUNT IN 4 - SQUARE JUNCTION BOX AND BE EQUIPPED WITH AN EXTERNAL LED VISIBLE FROM FLOW OR VALVE SUPERVISORY SWITCH. PROGRAM ACTIVATION OF WATER FLOW SWITCH AS AN ALARM SIGNAL AND ACTIVATION OF VALVE SUPERVISORY SWITCHES AS A SUPERVISORY SIGNAL.
- EXTEND SIGNALING LINE CIRCUITS (SLC) FROM FACP IN ADMINISTRATION BUILDING TO INITIATING DEVICES AND REMOTE NOTIFICATION CIRCUIT. POWER SUPPLIES IN LABORATORY, HEAVY EQUIPMENT/PAINT STORAGE AND WAREHOUSE/SHOP BUILDINGS. INSTALL SLC IN EXISTING BURIED CONDUITS THAT RUN BETWEEN ELECTRICAL ROOM IN EACH BUILDING AND UNDERGROUND VAULT LOCATED BETWEEN ADMINISTRATION AND LABORATORY BUILDING (SEE SHEET FP-11). PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSORS IN ACCORDANCE WITH NFPA 70 ARTICLE 285 ON SLC AT EACH POINT THAT THE CIRCUIT ENTERS OR EXITS A BUILDING. TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER RECOMMENDATIONS. PROVIDE ADDITIONAL SLC CIRCUITS OR CIRCUIT EXTENDER/REPEATER AS REQUIRED. CABLE INSTALLED IN BURIED CONDUITS SHALL BE SUITABLE FOR INSTALLATION SUBMERGED IN WATER.
- FURNISH AND INSTALL A REMOTE POWER SUPPLY TO POWER NOTIFICATION APPLIANCE CIRCUITS (NAC) FOR THE LABORATORY, HEAVY EQUIPMENT/PAINT STORAGE AND WAREHOUSE/SHOP BUILDINGS. PROVIDE AN ADDRESSABLE RELAY MODULE TO ACTIVATE NAC CIRCUITS UPON OPERATION OF INITIATING DEVICES. IN THAT BUILDING ONLY. PROVIDE AN ADDRESSABLE MONITOR MODULE TO SUPERVISE TROUBLE CONTACTS OF REMOTE POWER SUPPLY. INSTALL BATTERIES TO PROVIDE SECONDARY POWER SUPPLY FOR 24 HOURS IN STANDBY AND 5 MINUTES IN ALARM. LAYOUT OF NAC CIRCUITS SHALL LIMIT VOLTAGE DROP BETWEEN POWER SUPPLY AND MOST REMOTE APPLIANCE TO LESS THAN 20%. PROVIDE MODULES AS REQUIRED TO SYNCHRONIZE STROBE FLASHES OF ALL NOTIFICATION APPLIANCES WITHIN A SINGLE FIELD OF VIEW. LOCATION OF REMOTE POWER SUPPLY MAY BE ADJUSTED IN FIELD AS REQUIRED TO COORDINATE WITH EXISTING BUILDING SYSTEMS AND EQUIPMENT.
- FURNISH AND INSTALL SMOKE DETECTORS AT EACH ELEVATOR LOBBY AND IN THE ELEVATOR EQUIPMENT ROOM TO PROVIDE ELEVATOR RECALL FUNCTIONS IN ACCORDANCE WITH NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAYS TO INTERFACE WITH ELEVATOR CONTROLS AND PROGRAM RECALL FUNCTIONS AS FOLLOWS:  
1. OPERATION OF SMOKE DETECTOR 2ND FLOOR LOBBY AND ELEVATOR EQUIPMENT ROOM - ELEVATOR RECALL TO 1ST FLOOR.  
2. OPERATION OF SMOKE DETECTOR 1ST FLOOR LOBBY - ELEVATOR RECALL TO 2ND FLOOR. CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL HEAT DETECTORS ADJACENT TO FIRE SPRINKLERS IN ELEVATOR PIT AND ELEVATOR MACHINE ROOM. HEAT DETECTORS SHALL CONFORM TO NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAY AND SHUNT TRIP BREAKER TO DISCONNECT POWER TO ELEVATOR EQUIPMENT UPON OPERATION OF EITHER HEAT DETECTOR. CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL ADDRESSABLE RELAY TO PROVIDE ACTUATION OF FIRE/SMOKE DAMPERS. RELAY SHALL BE NORMALLY ENERGIZED AND RATED FOR VOLTAGE AND CURRENT REQUIRED FOR DAMPER ACTUATION.
- PROVIDE PROGRAMMABLE RELAY TO RELEASE EXISTING DOOR HOLD-OPEN DEVICES ON EXISTING FIRE DOORS. RELAY SHALL RELEASE DOORS UPON RECEIPT OF ANY FIRE ALARM SIGNAL AT FACP. POWER TO DOOR HOLD-OPEN DEVICES SHALL BE PROVIDED BY FACP.

FIRE ALARM EQUIPMENT LEGEND

DEVICE	DESCRIPTION	MOUNTING	REMARKS
FACP	FIRE ALARM CONTROL PANEL	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	SILENT KNIGHT MODEL 5820XL OR FIRE-LITE MS-9600 WITH DACT-UD
ANN	FIRE ALARM ANNUNCIATOR PANEL	WALL MOUNT ON RECESSED J-BOX AT 54" AFF.	KEY PAD WITH ALPHA-NUMERIC (MINIMUM 80 CHARACTERS) WITH INPUT KEYS TO ALLOW SYSTEM RESET AND ALARM SILENCE.
NAC-PS	REMOTE POWER SUPPLIES FOR NOTIFICATION APPLIANCE CIRCUITS	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONTROLLED BY ADDRESSABLE RELAY ON SIGNALING LINE CIRCUIT.
SCD	ADDRESSABLE SMOKE DETECTOR	CEILING MOUNT ON RECESSED	INSTALL ON CEILING IN ALL CORRIDORS, LOBBIES AND ABOVE FIRE ALARM CONTROL EQUIPMENT AS INDICATED ON PLANS.
HCD	ADDRESSABLE HEAT DETECTOR	SURFACE MOUNT ON J-BOX WITHIN 24" OF FIRE SPRINKLER	TO PROVIDE POWER DISCONNECT TO ELEVATOR PRIOR TO OPERATION OF ADJACENT SPRINKLER.
P	ADDRESSABLE PULL STATION	WALL MOUNT AT 48" AFF. ON RECESSED J-BOX. CONDUIT SHALL BE CONCEALED IN WALL.	INSTALL AT EACH EXIT DOOR AS INDICATED ON PLANS.
M	ADDRESSABLE MONITOR MODULE	MOUNT ON 4-SQUARE J-BOX NEAR CONVENTIONAL DEVICE TO BE MONITORED.	TO FACILITATE MONITORING OF CONTACTS OF CONVENTIONAL INITIATING DEVICES AS AN ADDRESSABLE POINT.
C	ADDRESSABLE CONTROL MODULE	MOUNT ON 4 - SQUARE J-BOX WITHIN 5' OF DEVICE OR CIRCUIT CONTROLLED	FOR PROTECTED PREMISE FIRE SAFETY FUNCTIONS (ELEVATOR RECALL AND NAC ACTIVATION).
WFS	WATER FLOW SWITCH	FIRE SPRINKLER RISER	TO DETECT WATER FLOW IN FIRE SPRINKLER SYSTEM.
VS	VALVE SUPERVISORY SWITCH	FIRE SPRINKLER CONTROL VALVES	TO MONITOR POSITION OF CONTROL VALVES.
AS	FIRE ALARM STROBE	WALL MOUNT AT 80" AFF. OR CEILING MOUNT ON RECESSED J-BOX	STROBE SHALL HAVE A MINIMUM CANDELA RATING OF 150CD INTENSITY. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
ASW	FIRE ALARM HORN/STROBE (WALL)	WALL MOUNT AT 80" AFF. ON RECESSED J-BOX	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
ASCW	FIRE ALARM HORN/STROBE (CEILING)	CEILING MOUNTED ON RECESSED J-BOX	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
EH	EXTERIOR FIRE ALARM HORN	WALL MOUNT AT 10'-0" AFF. ON WEATHER PROOF BACK BOX	EXTERIOR ALARM. SET HORN VOLUME TO MAXIMUM LEVEL.
FD	FIRE/SMOKE DAMPER	EXISTING	PROVIDE ADDRESSABLE MODULE FOR CONTROL.
MC	MAGNETIC CONTACT DOOR HOLDER	EXISTING	PROVIDE CONTINUOUS 24 VDC POWER FROM FACP TO DOOR HOLDERS. PROVIDE CONTROL MODULE AND PROGRAM TO DISCONNECT POWER AND RELEASE DOORS UPON RECEIPT OF FIRE ALARM SIGNAL.

UDOT REGION 3  
PROVO, UTAH

FIRE ALARM SYSTEM UPGRADES  
DFCM PROJECT #05233900

FIRE ALARM  
SYSTEM PLAN  
ADMINISTRATION  
BUILDING LEVEL 2  
FP-3.2

DRAWING DATE:  
06/13/06

REVISION DATE:  
07/19/06

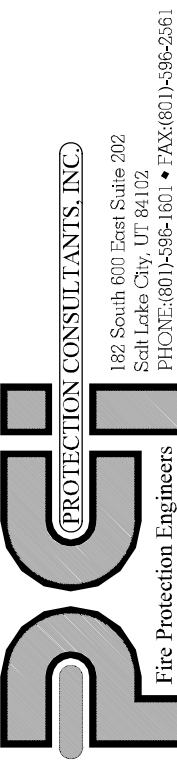
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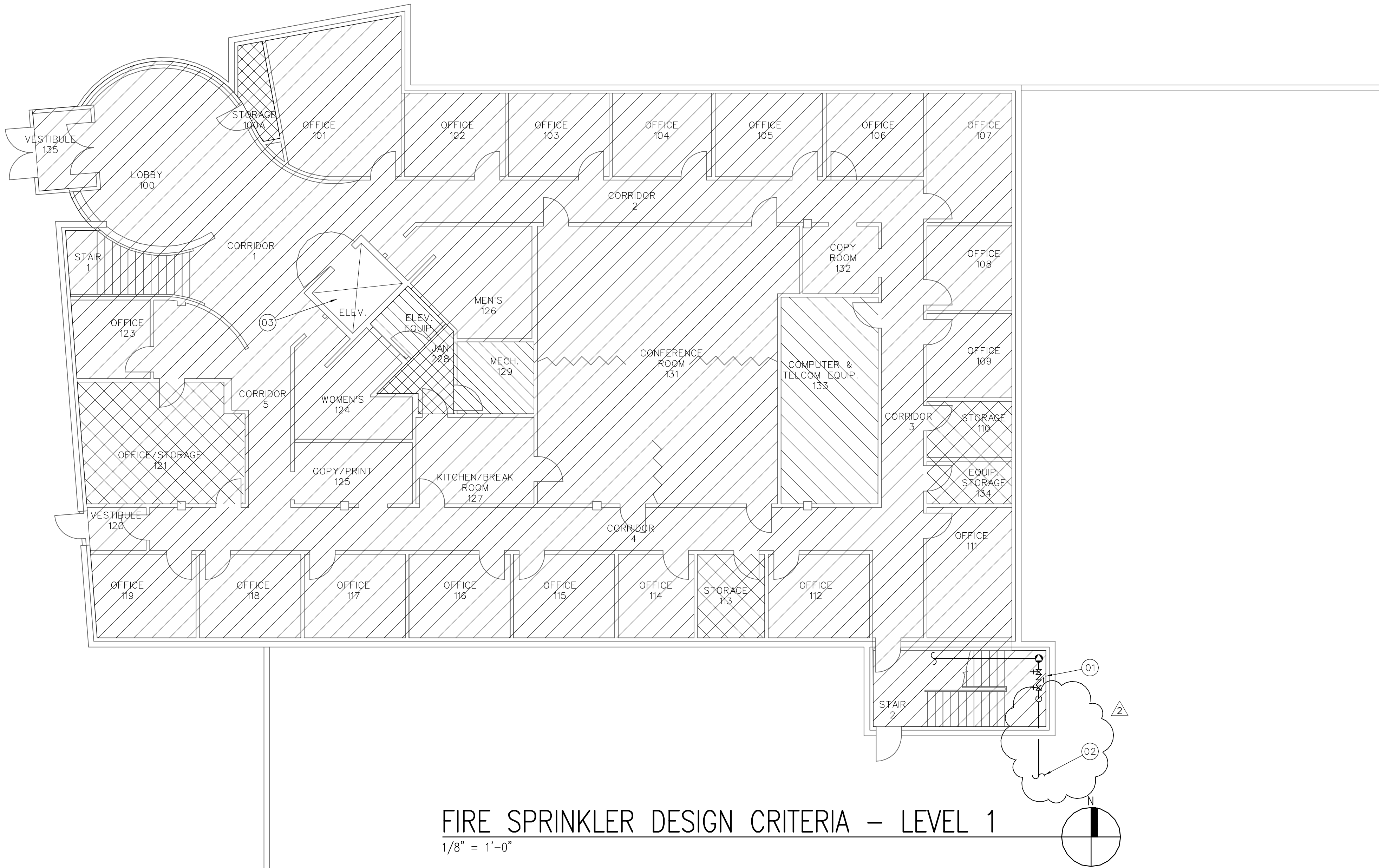
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REVISIONS:

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07/19/06

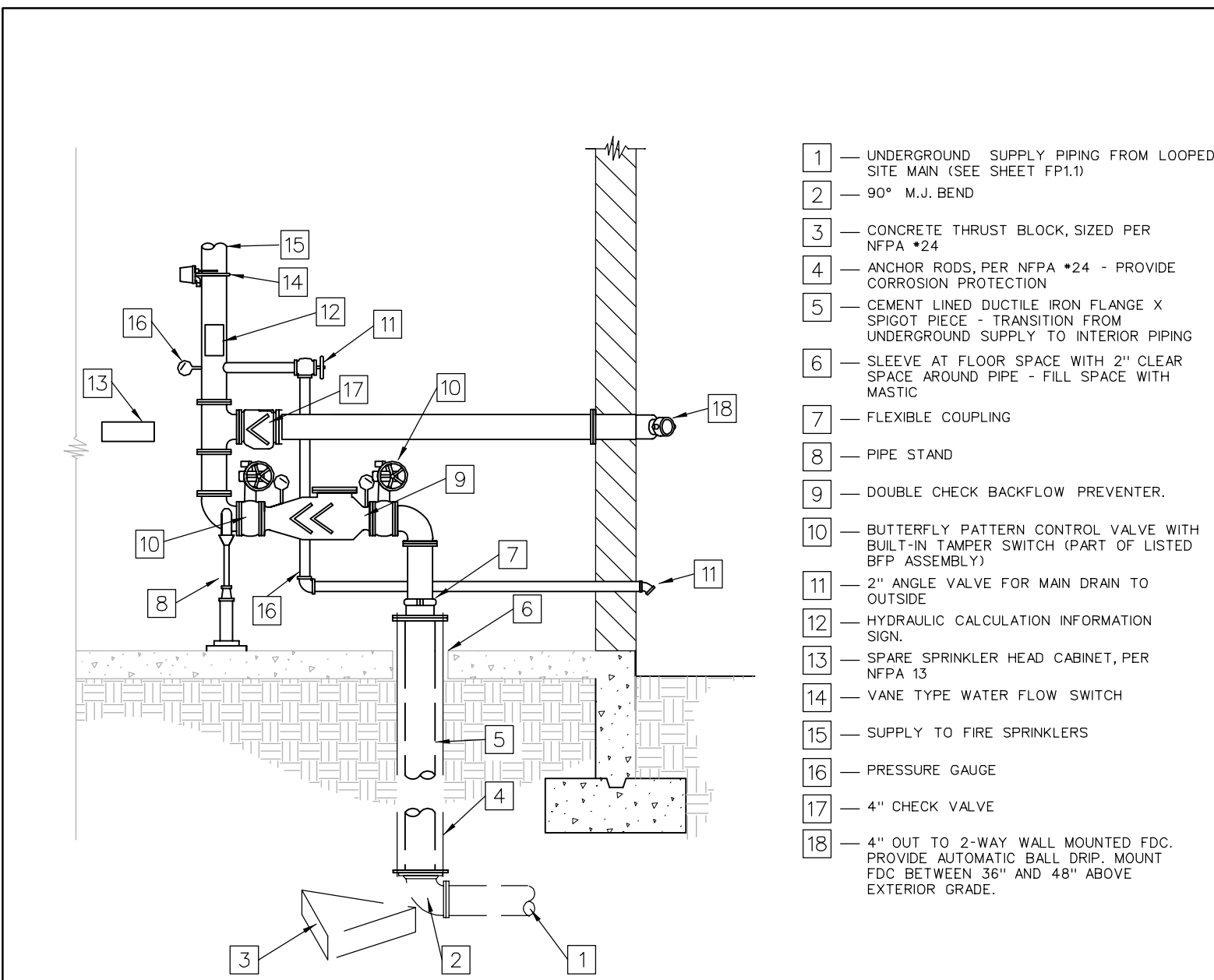






## FIRE SPRINKLER DESIGN CRITERIA - LEVEL 1

1/8" = 1'-0"



## ADMINISTRATION RISER DETAIL

N.T.S.

## FIRE SPRINKLER SYSTEM KEY NOTES

- 1 FIRE SPRINKLER SYSTEM RISER, SEE DETAIL ON DRAWINGS.
- 2 FURNISH AND INSTALL NEW UNDERGROUND FIRE SPRINKLER SUPPLY MAIN FOR EACH BUILDING IN ACCORDANCE WITH NFPA 13, NFPA 24 AND STATE OF UTAH DFCM REQUIREMENTS. CONNECT TO EXISTING 8" LOOPED SITE MAIN (SEE SHEET FP-1.1). COORDINATE WITH LOCATION OF EXISTING BURIED UTILITIES. EXISTING BURIED UTILITIES TO BE MARKED BY OWNER.
- 3 ~~INSTALL NEW FIRE SPRINKLERS TO PROTECT BOTTOM OF ELEVATOR SHAFT IN ACCORDANCE WITH NFPA 13 8.14.5.1. FIRE SPRINKLER AT TOP OF NON-COMBUSTIBLE ELEVATOR SHAFT MAY BE OMITTED IN ACCORDANCE WITH NFPA 13 8.14.5.5.~~
- 4 INSTALL SPRINKLERS TO PROTECT BELOW EXTERIOR CANOPY IN ACCORDANCE WITH NFPA 13 8.14.7. SPACING OF SPRINKLERS SHALL CONFORM TO REQUIREMENTS FOR ORDINARY HAZARD. PROTECT PIPING FROM FREEZING BY PROVIDING SMALL ANTIFREEZE LOOP IN ACCORDANCE WITH NFPA 13 FIGURE 7.5.3.1.
- 5 PROVIDE UL LISTED CORROSION RESISTANT SPRINKLER IN MOIST ROOM.
- 6 PROVIDE SPRINKLERS AT ROOF DECK AND BELOW SUSPENDED CEILING.

## FIRE SPRINKLER SYSTEM GENERAL NOTES

1. PROVIDE AND INSTALL A COMPLETE FIRE SPRINKLER SYSTEM PER NFPA 13 (2002 EDITION), THE PROJECT SPECIFICATIONS AND THESE DRAWINGS TO PROVIDE FIRE PROTECTION OF EACH BUILDING. WORK SHALL BEGIN BY CONNECTING TO EXISTING LOOPED SITE MAIN AND INSTALLING NEW UNDERGROUND FIRE SPRINKLER LATERAL. OVERHEAD PIPING SHALL NOT BE CONNECTED TO UNDERGROUND PIPING UNTIL UNDERGROUND PIPING HAS BEEN FLUSHED AND TESTED IN ACCORDANCE WITH NFPA 24.
2. FIRE SPRINKLER CONTRACTOR SHALL PREPARE AND SUBMIT FIRE SPRINKLER SHOP DRAWINGS, HYDRAULIC CALCULATIONS AND EQUIPMENT DATA SHEETS TO UTAH STATE FIRE MARSHAL'S OFFICE, DFCM AND PROJECT ENGINEER.
3. FIRE SPRINKLER SYSTEMS SHALL BE DESIGNED TO SUPPLY THE DISCHARGE DENSITIES INDICATED ON THE DRAWINGS.
4. ALL MATERIALS, DEVICES AND EQUIPMENT SHALL BE U.L. LISTED OR F.M. APPROVED FOR USE IN FIRE PROTECTION SYSTEMS. INSTALLER SHALL BE LICENSED TO INSTALL FIRE SPRINKLER SYSTEMS IN THE STATE OF UTAH.
5. ALL HORIZONTAL PIPING SHALL BE INSTALLED 2'-0" (MAINS) OR 1'-0" (BRANCH LINES) CENTERLINE BELOW ROOF DECK. WHERE CEILINGS ARE NOT PROVIDED, DEFLECTORS OF SPRINKLERS SHALL BE LOCATED WITHIN 12" OF THE ROOF DECK. ADJUST ELEVATION AS REQUIRED TO AVOID CONFLICTS WITH STEEL BEAMS.
6. PIPING:  
PROVIDE STEEL PIPING CONFORMING TO ANSI/ASTM A53, ASTM A135 AND ASTM A795  
2-1/2" (NOMINAL) AND LARGER PIPING MAY BE SCHEDULE 10  
2" (NOMINAL) AND SMALLER PIPING SHALL SCHEDULE 40 OR APPROVED EQUAL  
ALL PIPING SHALL HAVE A CRR (U.L. CORROSION RESISTANCE RATIO) EQUAL TO OR GREATER THAN 1.0.
7. FITTINGS:  
PROVIDE CAST IRON FITTINGS FOR THREADED PIPE. PROVIDE RUBBER GASKETED FITTINGS FOR ROLL GROOVED SCHEDULE 10 MAINS. PROVIDE WELDED OUTLETS FOR BRANCH LINE ATTACHMENTS TO MAINS. PLAIN END FITTINGS ARE NOT ACCEPTABLE.
8. HANGERS:  
1-1/4" AND SMALLER PIPING - MINIMUM ONE HANGER PER LENGTH OF PIPE AND MAXIMUM 12'-0" BETWEEN HANGERS.  
1-1/2" AND LARGER PIPING - MINIMUM ONE HANGER PER LENGTH OF PIPE AND MAXIMUM 15'-0" BETWEEN HANGERS.
9. SPRINKLER SPACING:  
LIGHT HAZARD: 225 SQ. FT. (MAXIMUM)  
ORDINARY HAZARD: 150 SQ. FT. (MAXIMUM)  
EXTRA HAZARD: 100 SQ. FT. (MAXIMUM)  
WAREHOUSE & HIGH PILED STORAGE: 100 SQ. FT. (MAXIMUM)
10. SEISMIC BRACING: BRACING PROVIDED FOR ALL PIPING AS REQUIRED BY NFPA #13 USING SCHEDULE 40 PIPE. RIGID COUPLINGS USED ON FEED MAINS AND CROSS MAINS. BRACING SHALL BE ATTACHED TO STRUCTURAL MEMBERS IN ACCORDANCE WITH NFPA 13.
11. PROVIDE EXTRA SPRINKLERS PER NFPA 13 FOR PROTECTION BELOW DUCTS, CONDUIT, OR SIMILAR EXPOSED OBSTRUCTIONS OVER 48" WIDE. PROVIDE EXTRA SPRINKLERS AS REQUIRED BY NFPA 13 WHERE SPRINKLER HEAD DISCHARGE IS OBSTRUCTED.
12. PROVIDE FIRE SPRINKLERS IN ACCORDANCE WITH NFPA 13 TO PROTECT ANY CONCEALED SPACES ENCLOSED WHOLLY OR PARTLY BY EXPOSED COMBUSTIBLE CONSTRUCTION.
13. WATER SUPPLY AVAILABLE FOR FIRE SPRINKLER SYSTEM ACCORDING TO WATER FLOW TEST CONDUCTED AT SITE BY PCI APRIL 14, 2006. PRESSURES REPORTED BELOW HAVE BEEN REDUCED BY 20% TO ACCOUNT FOR FUTURE DEVELOPMENT OF AREA AND MAY BE USED IN THE HYDRAULIC CALCULATIONS FOR THE FIRE SPRINKLER WITHOUT FURTHER REDUCTION:  
STATIC PRESSURE: 91 PSI  
RESIDUAL PRESSURE: 80 PSI  
FLOW: 1,343 GPM

## DESIGN DENSITY LEGEND

PATTERN	OCCUPANCY GROUP	DESIGN DENSITY (GPM/SQ FT)	DESIGN AREA (SQ FT)	HOSE ALLOWANCE (GPM)	AREAS
	LIGHT HAZARD	0.10	1,500	100	CORRIDORS, LOBBIES, OFFICE SPACES, BREAK ROOMS, RESTROOMS, CONFERENCES ROOMS, TRAINING ROOMS, ETC.
	ORDINARY HAZARD GROUP 1	0.15	1,500	250	ELECTRICAL ROOMS, COMMUNICATION ROOMS, MECHANICAL ROOMS, ETC.
	ORDINARY HAZARD GROUP 2	0.20	1,500	250	MISCELLANEOUS STORAGE, ELEVATOR EQUIPMENT AND PIT, LAB SPACE, JANITORIAL, VEHICLE PARKING, WASH & MAINTENANCE, WELDING SHOP, WOOD SHOP, CARPENTER SHOP, ELECTRICAL SHOP, PLAN ROOMS, ETC.
	EXTRA HAZARD GROUP 2	0.40	2,500	500	PAINT STORAGE, PAINT SHOP AND PAINT EQUIPMENT STORAGE
	TIRE STORAGE (6' HIGH ON PORTABLE RACK ON TREAD)	0.32	2,000	500	WAREHOUSE
	20' HIGH SINGLE ROW RACK STORAGE OF NON-ENCAPSULATED CLASS IV COMMODITY	0.445	ENTIRE AREA PLUS ENOUGH ADJACENT OR DENSITY AREA TO INCLUDE A TOTAL OF 2,000	500	ELECTRIC SHOP

UDOT REGION 3  
PROVO, UTAH

FIRE ALARM SYSTEM UPGRADES  
DFCM PROJECT #05233900

FIRE SPRINKLER  
DESIGN CRITERIA  
ADMINISTRATION  
BUILDING LEVEL 1  
FP-2.1

JOB NO. 103991

DWG ISSUE:  
ADDENDUM #2

DRAWN BY: BAJ  
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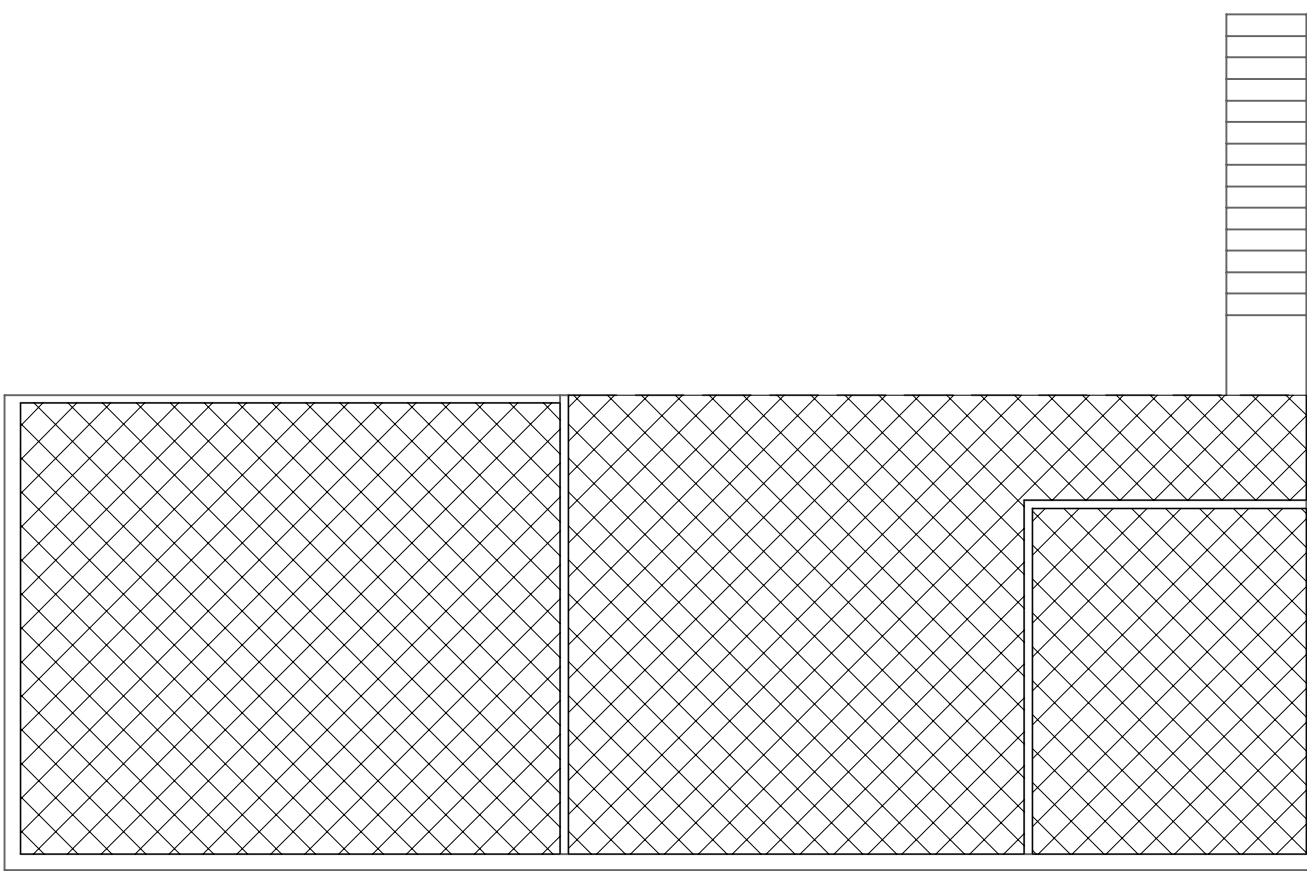
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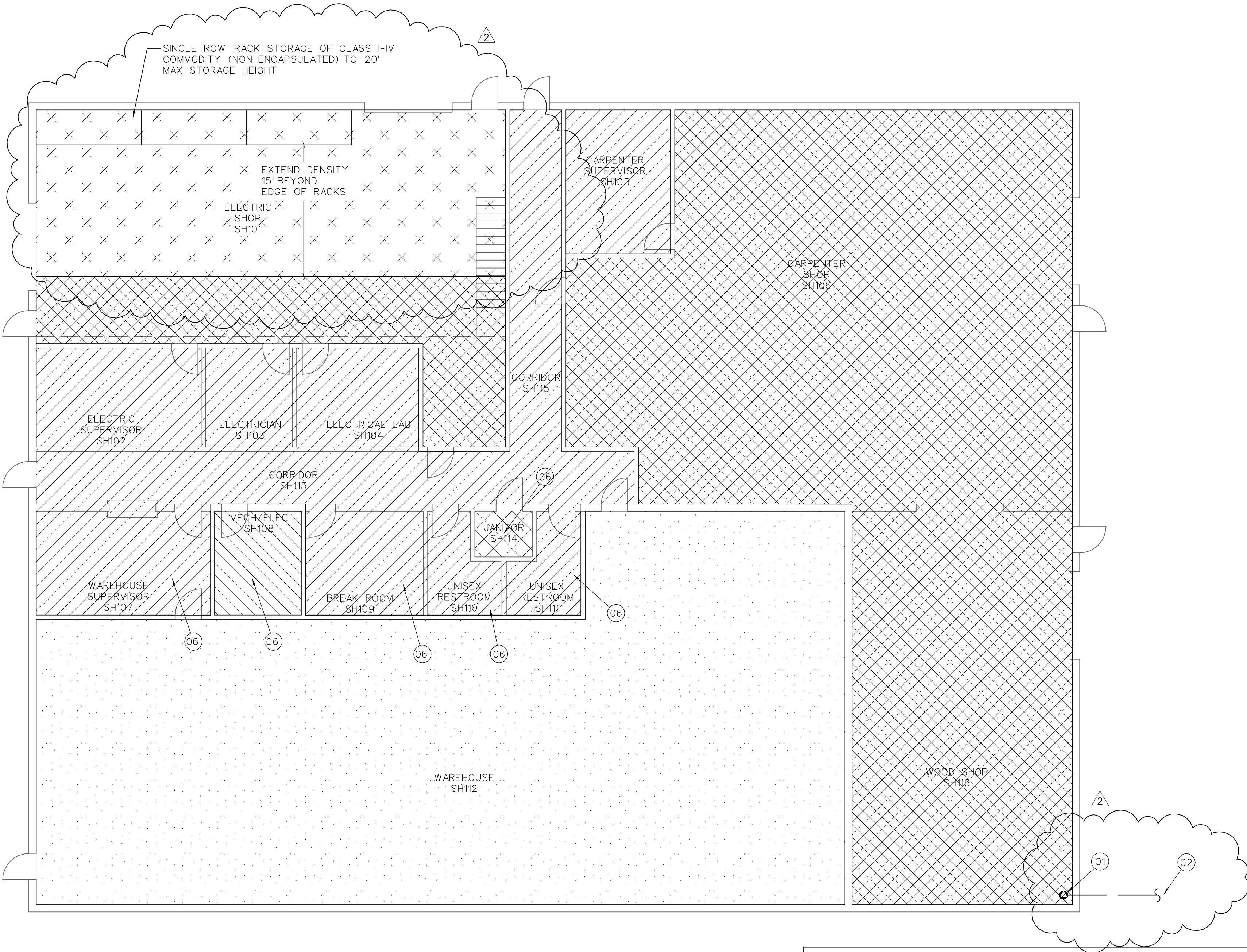
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REVISION DATE:  
07/19/06

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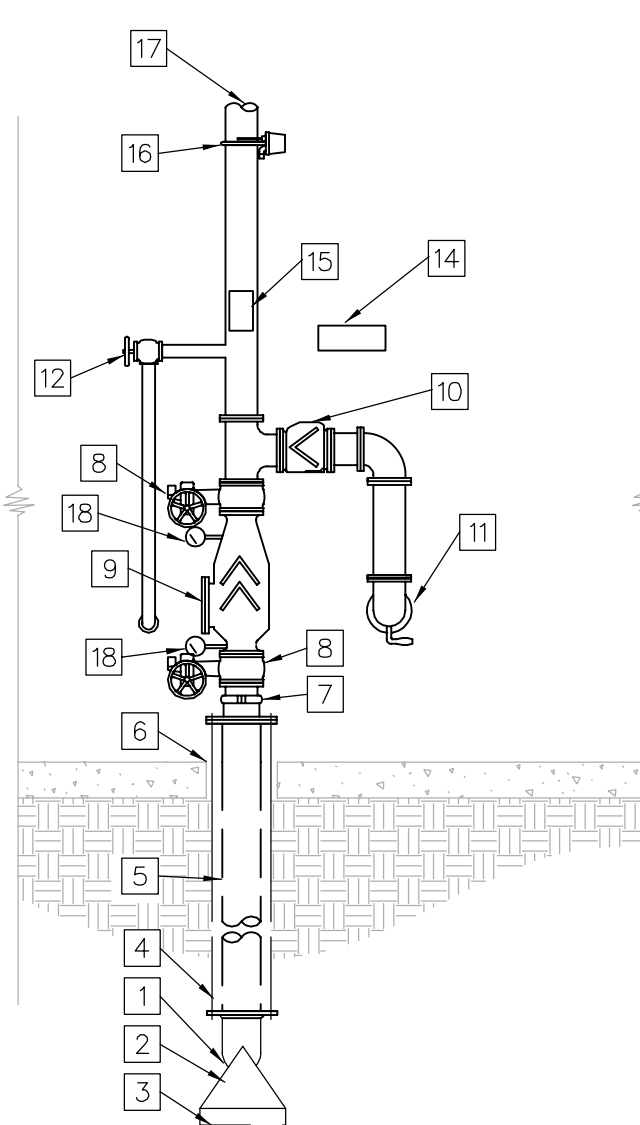
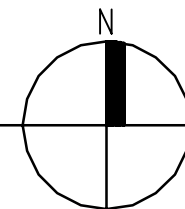


STORAGE MEZZANINE



## FIRE SPRINKLER DESIGN CRITERIA – WAREHOUSE/SHOP BUILDING

1/8" = 1'-0"



WAREHOUSE RISER DETAIL

N.T.S.

## FIRE SPRINKLER SYSTEM KEY NOTES

- 1 FIRE SPRINKLER SYSTEM RISER. SEE DETAIL ON DRAWINGS.
- 2 FURNISH AND INSTALL NEW UNDERGROUND FIRE SPRINKLER SUPPLY MAIN FOR EACH BUILDING IN ACCORDANCE WITH NFPA 13, NFPA 24 AND STATE OF UTAH DFCM REQUIREMENTS. CONNECT TO EXISTING 8" LOOPED SITE MAIN (SEE SHEET FP-1.1). COORDINATE WITH LOCATION OF EXISTING BURIED UTILITIES. EXISTING BURIED UTILITIES TO BE MARKED BY OWNER.
- 3 INSTALL A SIDE WALL SPRINKLER TO PROTECT BOTTOM OF ELEVATOR SHAFT IN ACCORDANCE WITH NFPA 13 8.14.5.1. FIRE SPRINKLER AT TOP OF NON-COMBUSTIBLE ELEVATOR SHAFT MAY BE OMITTED IN ACCORDANCE WITH NFPA 13 8.14.5.5.
- 4 INSTALL SPRINKLERS TO PROTECT BELOW EXTERIOR CANOPY IN ACCORDANCE WITH NFPA 13 8.14.7. SPACING OF SPRINKLERS SHALL CONFORM TO REQUIREMENTS FOR ORDINARY HAZARD. PROTECT PIPING FROM FREEZING BY PROVIDING SMALL ANTIFREEZE LOOP IN ACCORDANCE WITH NFPA 13 FIGURE 7.5.3.1.
- 5 PROVIDE UL LISTED CORROSION RESISTANT SPRINKLER IN MOIST ROOM.
- 6 PROVIDE SPRINKLERS AT ROOF DECK AND BELOW SUSPENDED CEILING.

## FIRE SPRINKLER SYSTEM GENERAL NOTES

1. PROVIDE AND INSTALL A COMPLETE FIRE SPRINKLER SYSTEM PER NFPA 13 (2002 EDITION), THE PROJECT SPECIFICATIONS AND THESE DRAWINGS TO PROVIDE FIRE PROTECTION OF EACH BUILDING. WORK SHALL BEGIN BY CONNECTING TO EXISTING LOOPED SITE MAIN AND INSTALLING NEW UNDERGROUND FIRE SPRINKLER LATERAL. OVERHEAD PIPING SHALL NOT BE CONNECTED TO UNDERGROUND PIPING UNTIL UNDERGROUND PIPING HAS BEEN FLUSHED AND TESTED IN ACCORDANCE WITH NFPA 24.
2. FIRE SPRINKLER CONTRACTOR SHALL PREPARE AND SUBMIT FIRE SPRINKLER SHOP DRAWINGS, HYDRAULIC CALCULATIONS AND EQUIPMENT DATA SHEETS TO UTAH STATE FIRE MARSHAL'S OFFICE, DFCM AND PROJECT ENGINEER.
3. FIRE SPRINKLER SYSTEMS SHALL BE DESIGNED TO SUPPLY THE DISCHARGE DENSITIES INDICATED ON THE DRAWINGS.
4. ALL MATERIALS, DEVICES AND EQUIPMENT SHALL BE U.L. LISTED OR F.M. APPROVED FOR USE IN FIRE PROTECTION SYSTEMS. INSTALLER SHALL BE LICENSED TO INSTALL FIRE SPRINKLER SYSTEMS IN THE STATE OF UTAH.
5. ALL HORIZONTAL PIPING SHALL BE INSTALLED 2'-0" (MAINS) OR 1'-0" (BRANCH LINES) CENTERLINE BELOW ROOF DECK. WHERE CEILINGS ARE NOT PROVIDED, DEFLECTORS OF SPRINKLERS SHALL BE LOCATED WITHIN 12" OF THE ROOF DECK. ADJUST ELEVATION AS REQUIRED TO AVOID CONFLICTS WITH STEEL BEAMS.
6. PIPING:  
PROVIDE STEEL PIPING CONFORMING TO ANSI/ASTM A53, ASTM A135 AND ASTM A795  
2-1/2" (NOMINAL) AND LARGER PIPING MAY BE SCHEDULE 10  
2" (NOMINAL) AND SMALLER PIPING SHALL SCHEDULE 40 OR APPROVED EQUAL.  
ALL PIPING SHALL HAVE A CRR (U.L. CORROSION RESISTANCE RATIO) EQUAL TO OR GREATER THAN 1.0.
7. FITTINGS:  
PROVIDE CAST IRON FITTINGS FOR THREADED PIPE. PROVIDE RUBBER GASKETED FITTINGS FOR ROLL GROOVED SCHEDULE 10 MAINS. PROVIDE WELDED OUTLETS FOR BRANCH LINE ATTACHMENTS TO MAINS. PLAIN END FITTINGS ARE NOT ACCEPTABLE.
8. HANGERS:  
1-1/4" AND SMALLER PIPING - MINIMUM ONE HANGER PER LENGTH OF PIPE AND MAXIMUM 12'-0" BETWEEN HANGERS.  
1-1/2" AND LARGER PIPING - MINIMUM ONE HANGER PER LENGTH OF PIPE AND MAXIMUM 15'-0" BETWEEN HANGERS.
9. SPRINKLER SPACING:  
LIGHT HAZARD: 205 SQ. FT. (MAXIMUM)  
ORDINARY HAZARD: 150 SQ. FT. (MAXIMUM)  
EXTRA HAZARD: 100 SQ. FT. (MAXIMUM)  
WAREHOUSE & HIGH PILED STORAGE: 100 SQ. FT. (MAXIMUM)
10. BRANCH BRACING SHALL BE PROVIDED FOR MAINS AS REQUIRED BY NFPA 13 USING SCHEDULE 40 PIPE. RIGID COUPLINGS USED ON FEED MAINS AND CROSS MAINS. BRACING SHALL BE ATTACHED TO STRUCTURAL MEMBERS IN ACCORDANCE WITH NFPA 13.
11. PROVIDE EXTRA SPRINKLERS PER NFPA 13 FOR PROTECTION BELOW DUCTS, CONDUIT, OR SIMILAR EXPOSED OBSTRUCTIONS OVER 48" WIDE. PROVIDE EXTRA SPRINKLERS AS REQUIRED BY NFPA 13 WHERE SPRINKLER HEAD DISCHARGE IS OBSTRUCTED.
12. PROVIDE FIRE SPRINKLERS IN ACCORDANCE WITH NFPA 13 TO PROTECT ANY CONCEALED SPACES ENCLOSED WHOLLY OR PARTLY BY EXPOSED COMBUSTIBLE CONSTRUCTION.
13. WATER SUPPLY AVAILABLE FOR FIRE SPRINKLER SYSTEM ACCORDING TO WATER FLOW TEST CONDUCTED AT SITE BY PCI APRIL 14, 2008. PRESSURES REPORTED BELOW HAVE BEEN REDUCED BY 20% TO ACCOUNT FOR FUTURE DEVELOPMENT OF AREA AND MAY BE USED IN THE HYDRAULIC CALCULATIONS FOR THE FIRE SPRINKLER WITHOUT FURTHER REDUCTION:  
STATIC PRESSURE: 91 PSI  
RESIDUAL PRESSURE: 80 PSI  
FLOW: 1,343 GPM

## DESIGN DENSITY LEGEND

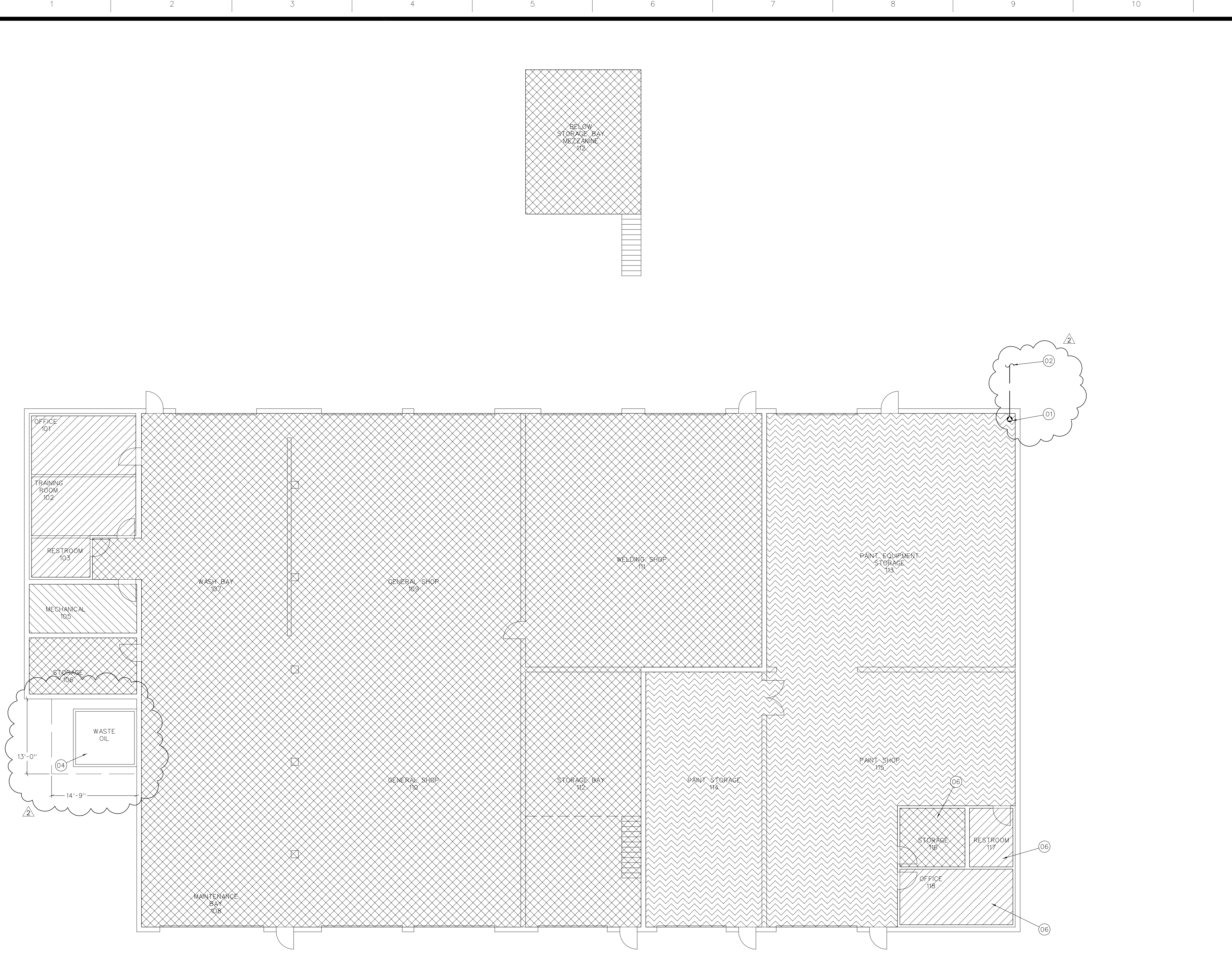
PATTERN	OCCUPANCY GROUP	DESIGN DENSITY (GPM/SQ FT)	DESIGN AREA (SQ FT)	HOSE ALLOWANCE (GPM)	AREAS
	LIGHT HAZARD	0.10	1,500	100	CORRIDORS, LOBBIES, OFFICE SPACES, BREAK ROOMS, RESTROOMS, CONFERENCES ROOMS, TRAINING ROOMS, ETC.
	ORDINARY HAZARD GROUP 1	0.15	1,500	250	ELECTRICAL ROOMS, COMMUNICATION ROOMS, MECHANICAL ROOMS, ETC.
	ORDINARY HAZARD GROUP 2	0.20	1,500	250	MISCELLANEOUS STORAGE, ELEVATOR EQUIPMENT AND PIT, LAB SPACE, JANITORIAL, VEHICLE PARKING, WASH & MAINTENANCE, WELDING SHOP, WOOD SHOP, CARPENTER SHOP, ELECTRICAL SHOP, PLAN ROOMS, ETC.
	EXTRA HAZARD GROUP 2	0.40	2,500	500	PAINT STORAGE, PAINT SHOP AND PAINT EQUIPMENT STORAGE
	TIRE STORAGE (6" HIGH ON PORTABLE RACK ON TREAD)	0.32	2,000	500	WAREHOUSE
	20' HIGH SINGLE ROW RACK STORAGE OF NON-ENCAPSULATED CLASS I-IV COMMODITY	0.445	ENTIRE AREA PLUS ENOUGH ADJACENT HIGH DENSITY AREA TO INCLUDE A TOTAL OF 2,000	500	ELECTRIC SHOP

UDOT REGION 3  
PROVO, UTAH

FIRE ALARM SYSTEM UPGRADES  
DFCM PROJECT #05233900

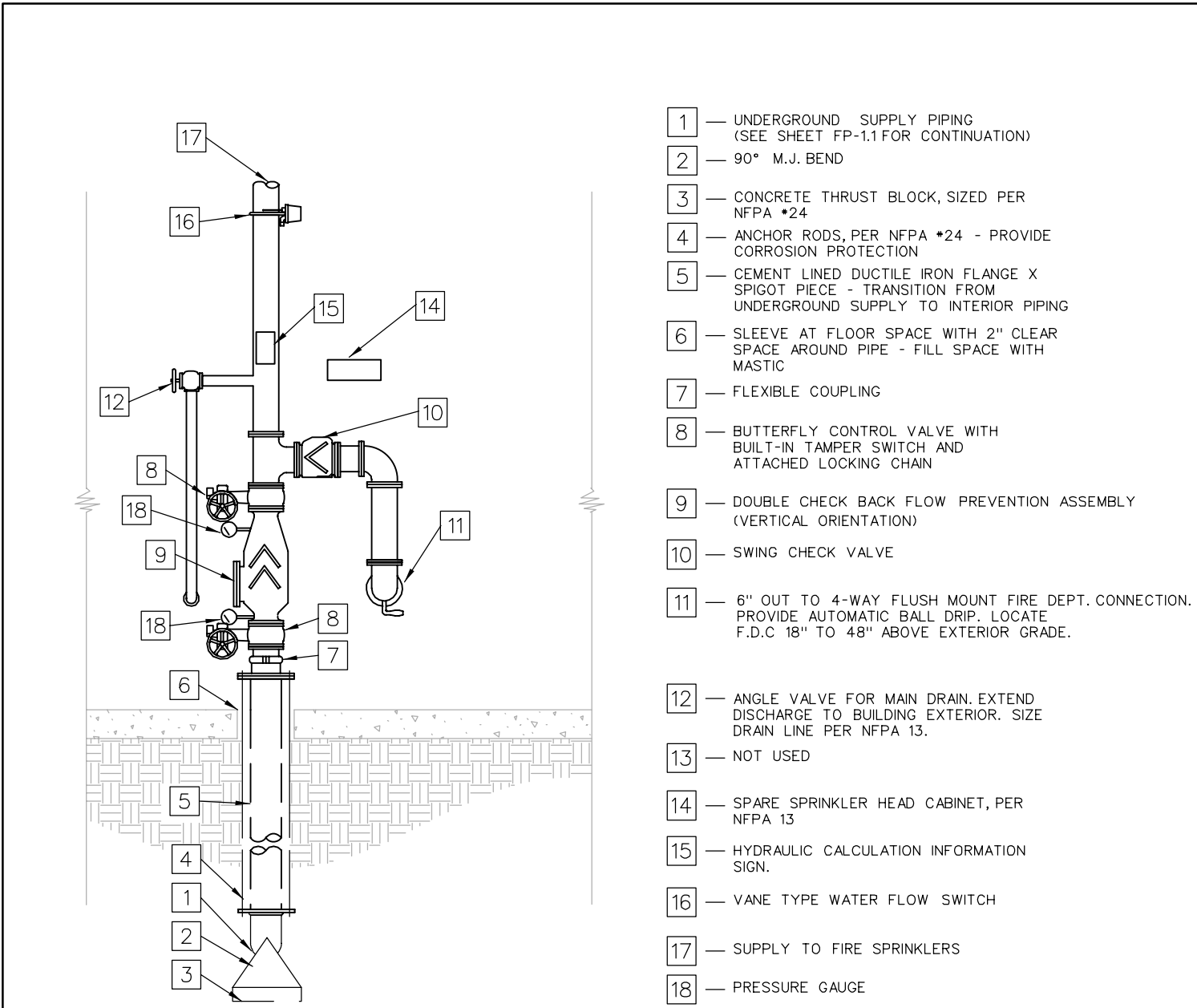
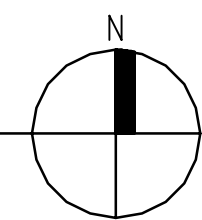
FIRE SPRINKLER  
DESIGN CRITERIA  
WAREHOUSE/SHOP  
BUILDING  
FP-2.5





## FIRE SPRINKLER DESIGN CRITERIA – HEAVY EQUIPMENT/ PAINT STG. BLDG.

1/8" = 1'-0"



## HEAVY EQUIPMENT/PAINT STORAGE RISER DETAIL

N.T.S.

## FIRE SPRINKLER SYSTEM KEY NOTES

- 1 FIRE SPRINKLER SYSTEM RISER: SEE DETAIL ON DRAWINGS.
- 2 FURNISH AND INSTALL NEW UNDERGROUND FIRE SPRINKLER SUPPLY MAIN FOR EACH BUILDING IN ACCORDANCE WITH NFPA 13, NFPA 24 AND STATE OF UTAH DFCM REQUIREMENTS. CONNECT TO EXISTING 8" LOOPED SITE MAIN (SEE SHEET FP-1.1). COORDINATE WITH LOCATION OF EXISTING BURIED UTILITIES. EXISTING BURIED UTILITIES TO BE MARKED BY OWNER.
- 3 INSTALL A SIDEWALL SPRINKLER TO PROTECT BOTTOM OF ELEVATOR SHAFT IN ACCORDANCE WITH NFPA 13 8.14.5.1. FIRE SPRINKLER AT TOP OF NON-COMBUSTIBLE ELEVATOR SHAFT MAY BE OMITTED IN ACCORDANCE WITH NFPA 13 8.14.5.5.
- 4 INSTALL SPRINKLERS TO PROTECT BELOW EXTERIOR CANOPY IN ACCORDANCE WITH NFPA 13 8.14.7. SPACING OF SPRINKLERS SHALL CONFORM TO REQUIREMENTS FOR ORDINARY HAZARD. PROTECT PIPING FROM FREEZING BY PROVIDING SMALL ANTIFREEZE LOOP IN ACCORDANCE WITH NFPA 13 FIGURE 7.5.3.1.
- 5 PROVIDE U.L. LISTED CORROSION RESISTANT SPRINKLER IN MOIST ROOM.
- 6 PROVIDE SPRINKLERS AT ROOF DECK AND BELOW SUSPENDED CEILING.

## FIRE SPRINKLER SYSTEM GENERAL NOTES

1. PROVIDE AND INSTALL A COMPLETE FIRE SPRINKLER SYSTEM PER NFPA 13 (2002 EDITION), THE PROJECT SPECIFICATIONS AND THESE DRAWINGS TO PROVIDE FIRE PROTECTION OF EACH BUILDING. WORK SHALL BEGIN BY CONNECTING TO EXISTING LOOPED SITE MAIN AND INSTALLING NEW UNDERGROUND FIRE SPRINKLER LATERAL. OVERHEAD PIPING SHALL NOT BE CONNECTED TO UNDERGROUND PIPING UNTIL UNDERGROUND PIPING HAS BEEN FLUSHED AND TESTED IN ACCORDANCE WITH NFPA 24.
2. FIRE SPRINKLER CONTRACTOR SHALL PREPARE AND SUBMIT FIRE SPRINKLER SHOP DRAWINGS, HYDRAULIC CALCULATIONS AND EQUIPMENT DATA SHEETS TO UTAH STATE FIRE MARSHAL'S OFFICE, DFCM AND PROJECT ENGINEER.
3. FIRE SPRINKLER SYSTEMS SHALL BE DESIGNED TO SUPPLY THE DISCHARGE DENSITIES INDICATED ON THE DRAWINGS.
4. ALL MATERIALS, DEVICES AND EQUIPMENT SHALL BE U.L. LISTED OR F.M. APPROVED FOR USE IN FIRE PROTECTION SYSTEMS. INSTALLER SHALL BE LICENSED TO INSTALL FIRE SPRINKLER SYSTEMS IN THE STATE OF UTAH.
5. ALL HORIZONTAL PIPING SHALL BE INSTALLED 2'-0" (MAINS) OR 1'-0" (BRANCH LINES) CENTERLINE BELOW ROOF DECK. WHERE CEILINGS ARE NOT PROVIDED, DEFLECTORS OF SPRINKLERS SHALL BE LOCATED WITHIN 12" OF THE ROOF DECK. ADJUST ELEVATION AS REQUIRED TO AVOID CONFLICTS WITH STEEL BEAMS.
6. PIPING:  
PROVIDE STEEL PIPING CONFORMING TO ANSI/ASTM A53, ASTM A135 AND ASTM A795  
2-1/2" (NOMINAL) AND LARGER PIPING MAY BE SCHEDULE 10  
2" (NOMINAL) AND SMALLER PIPING SHALL SCHEDULE 40 OR APPROVED EQUAL.  
ALL PIPING SHALL HAVE A CRR (U.L. CORROSION RESISTANCE RATIO) EQUAL TO OR GREATER THAN 1.0.
7. FITTINGS:  
PROVIDE CAST IRON FITTINGS FOR THREADED PIPE. PROVIDE RUBBER GASKETED FITTINGS FOR ROLL GROOVED SCHEDULE 10 MAINS. PROVIDE WELDED OUTLETS FOR BRANCH LINE ATTACHMENTS TO MAINS. PLAIN END FITTINGS ARE NOT ACCEPTABLE.
8. HANGERS:  
1-1/4" AND SMALLER PIPING - MINIMUM ONE HANGER PER LENGTH OF PIPE AND MAXIMUM 12'-0" BETWEEN HANGERS.  
1-1/2" AND LARGER PIPING - MINIMUM ONE HANGER PER LENGTH OF PIPE AND MAXIMUM 15'-0" BETWEEN HANGERS.
9. SPRINKLER SPACING:  
LIGHT HAZARD: 225 SQ. FT. (MAXIMUM)  
ORDINARY HAZARD: 130 SQ. FT. (MAXIMUM)  
EXTRA HAZARD: 100 SQ. FT. (MAXIMUM)  
WAREHOUSE & HIGH PILED STORAGE: 100 SQ. FT. (MAXIMUM)
10. SEISMIC BRACING: BRACING PROVIDED FOR ALL PIPING AS REQUIRED BY NFPA #13 USING SCHEDULE 40 PIPE. RIGID COUPLINGS USED ON FEED MAINS AND CROSS MAINS. BRACING SHALL BE ATTACHED TO STRUCTURAL MEMBERS IN ACCORDANCE WITH NFPA 13.
11. PROVIDE EXTRA SPRINKLERS PER NFPA 13 FOR PROTECTION BELOW DUCTS, CONDUIT, OR SIMILAR EXPOSED OBSTRUCTIONS OVER 48" WIDE. PROVIDE EXTRA SPRINKLERS AS REQUIRED BY NFPA 13 WHERE SPRINKLER HEAD DISCHARGE IS OBSTRUCTED.
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STATIC PRESSURE: 91 PSI  
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FLOW: 1,343 GPM

## DESIGN DENSITY LEGEND

PATTERN	OCCUPANCY GROUP	DESIGN DENSITY (GPM/SQ FT)	DESIGN AREA (SQ FT)	HOSE ALLOWANCE (GPM)	AREAS
	LIGHT HAZARD	0.10	1,500	100	CORRIDORS, LOBBIES, OFFICE SPACES, BREAK ROOMS, RESTROOMS, CONFERENCES ROOMS, TRAINING ROOMS, ETC.
	ORDINARY HAZARD GROUP 1	0.15	1,500	250	ELECTRICAL ROOMS, COMMUNICATION ROOMS, MECHANICAL ROOMS, ETC.
	ORDINARY HAZARD GROUP 2	0.20	1,500	250	MISCELLANEOUS STORAGE, ELEVATOR EQUIPMENT AND PIT LAB SPACE, JANITORIAL, VEHICLE PARKING, WASH & MAINTENANCE, WELDING SHOP, WOOD SHOP, CARPENTER SHOP, ELECTRICAL SHOP, PLAN ROOMS, ETC.
	EXTRA HAZARD GROUP 2	0.40	2,500	500	PAINT STORAGE, PAINT SHOP AND PAINT EQUIPMENT STORAGE
	TIRE STORAGE (6' HIGH ON PORTABLE RACK ON TREAD)	0.32	2,000	500	WAREHOUSE
	20' HIGH SINGLE ROW RACK STORAGE OF NON-ENCAPSULATED CLASS HV COMMODITY	0.445	ENTIRE AREA PLUS ENOUGH ADJACENT OPEN AREA TO INCLUDE A TOTAL OF 2,000	500	ELECTRIC SHOP

UDOT REGION 3  
PROVO, UTAH

FIRE ALARM SYSTEM UPGRADES  
DFCM PROJECT #05233900

FIRE SPRINKLER  
DESIGN CRITERIA  
HEAVY EQUIP./ PAINT  
STORAGE BUILDING  
FP-2.4

JOB NO. 103991

DWG ISSUE: ADDENDUM #2

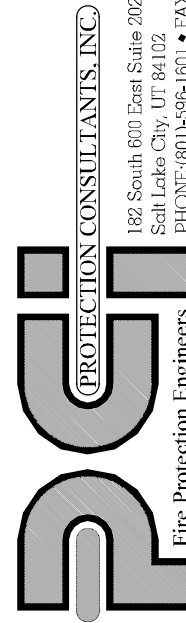
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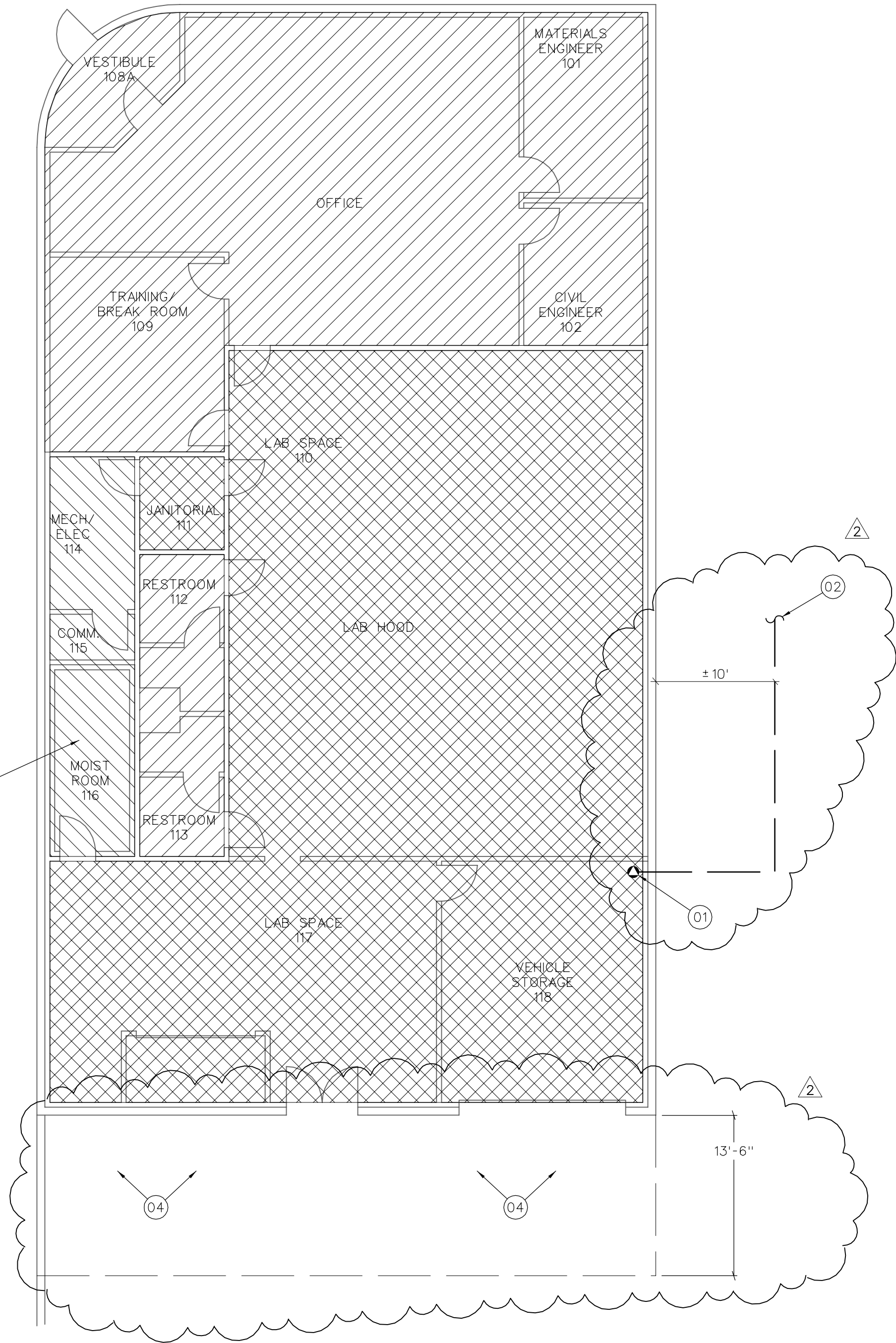
## REVISIONS:

2 ADDENDUM #2  
07/19/06

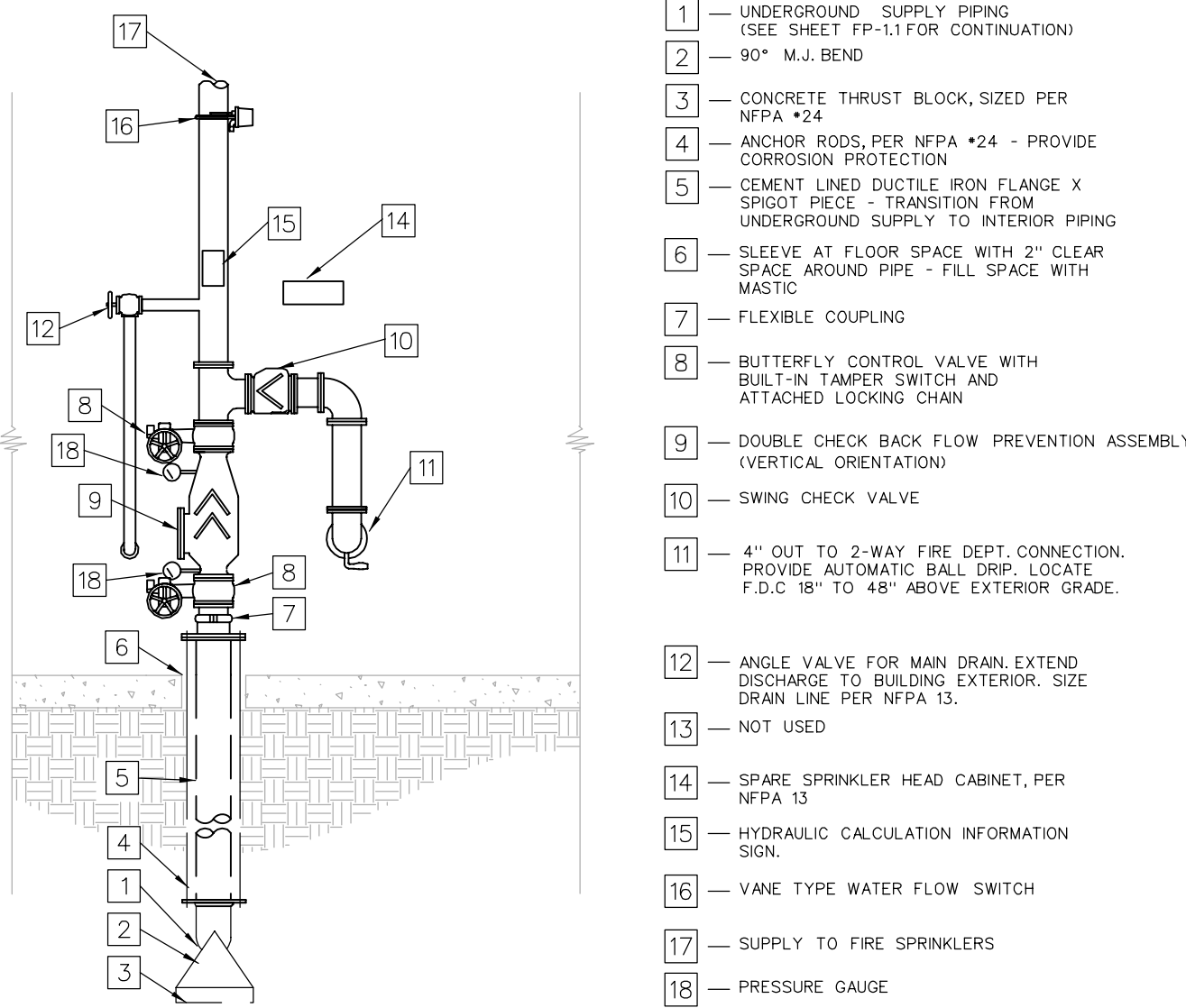
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06/13/06

REVISION DATE:  
07/19/06





FIRE SPRINKLER DESIGN CRITERIA – LABORATORY BUILDING  
1/8" = 1'-0"



LABORATORY RISER DETAIL

N.T.S.

### FIRE SPRINKLER SYSTEM KEY NOTES

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UDOT REGION 3  
PROVO, UTAH

FIRE ALARM SYSTEM UPGRADES  
DFCM PROJECT #05233900

FIRE SPRINKLER  
DESIGN CRITERIA  
LABORATORY  
BUILDING  
FP-2.3

JOB NO. 103991

DWG ISSUE: ADENDUM #2

DRAWN BY: BAJ  
CHECKED BY: GTJ

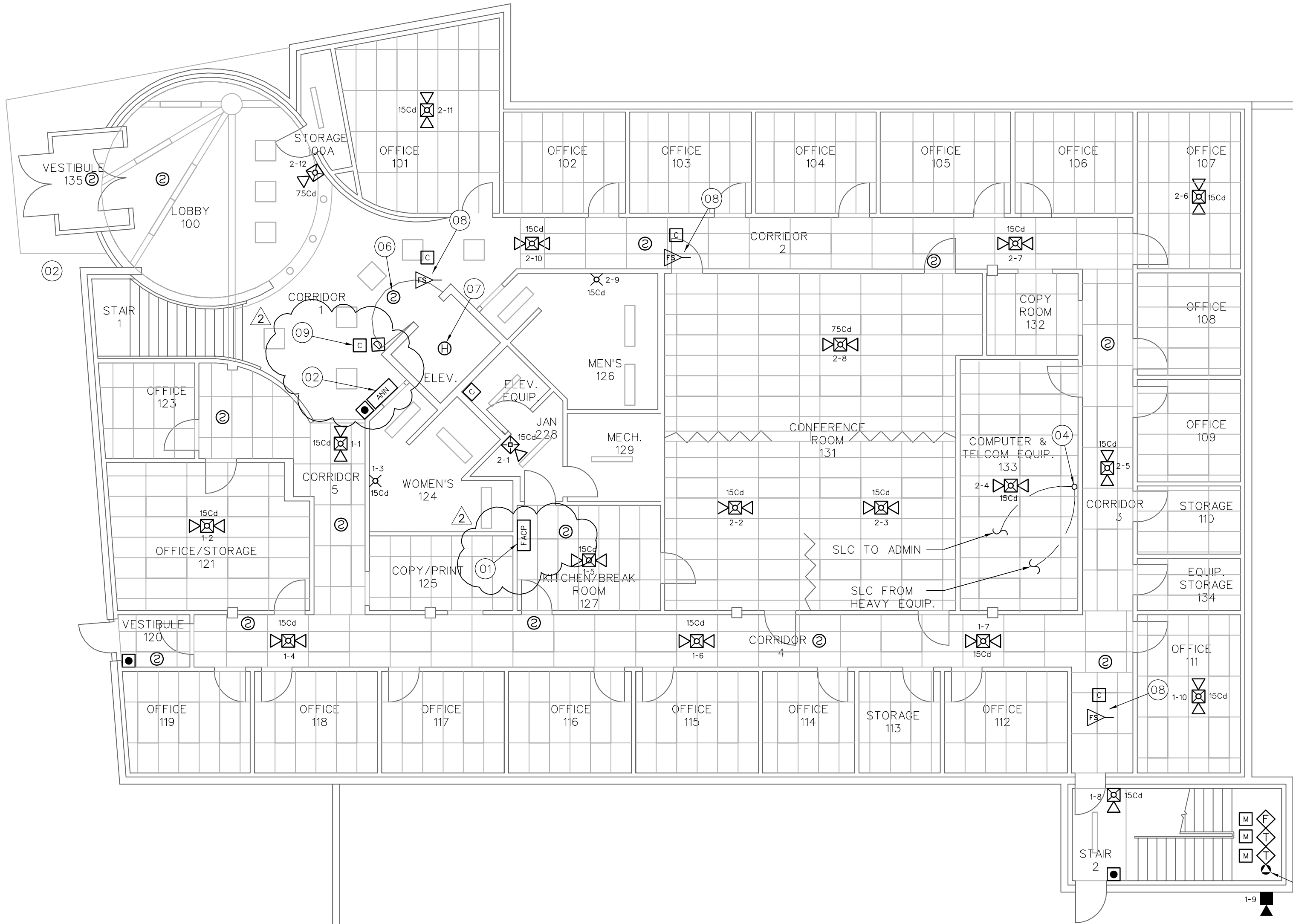
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ADENDUM #2  
07/19/06

DRAWING DATE:  
06/13/06

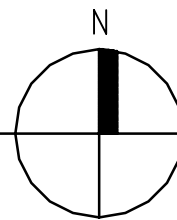
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07/19/06





FIRE ALARM SYSTEM PLAN – ADMINISTRATION BUILDING LEVEL 1

1/8" = 1'-0"



FIRE ALARM SYSTEM GENERAL NOTES

- SCOPE OF WORK: WORK SHALL INCLUDE INSTALLATION OF NEW ADDRESSABLE FIRE ALARM SYSTEM INCLUDING ALL CONTROL EQUIPMENT, POWER SUPPLIES, INITIATING DEVICES AND DEVICES, NOTIFICATION APPLIANCE CIRCUITS AND DEVICES REQUIRED TO CONSTITUTE A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM THROUGHOUT BUILDING IN ACCORDANCE WITH NFPA 72, IBC, IFC THESE DRAWINGS AND PROJECT SPECIFICATIONS.
- APPLICABLE CODES/STANDARDS:  
INTERNATIONAL BUILDING CODE - 2003 EDITION  
INTERNATIONAL FIRE CODE - 2003 EDITION  
UTAH STATE FIRE MARSHAL RULE R710-4  
NFPA 70 - 2002 EDITION  
NFPA 72 - 2002 EDITION
- QUALITY ASSURANCE: ALL EQUIPMENT, MATERIAL, AND DEVICES USED FOR THE FIRE ALARM SYSTEM INSTALLATION SHALL BE UL LISTED AND/OR FM APPROVED FOR USE IN FIRE PROTECTION SYSTEMS. ALL INITIATING DEVICES SHALL BE LISTED COMPATIBLE WITH THE FIRE ALARM CONTROL PANEL (FACP). MAJOR SYSTEM COMPONENTS (CONTROL PANELS, INITIATING DEVICES, ADDRESSABLE MODULES, AND RELAYS, POWER SUPPLIES, ETC.) SHALL BE FROM A STATE OF UTAH DFCM APPROVED MANUFACTURER. APPROVED MANUFACTURERS INCLUDE FIRE-LITE AND SILENT KNIGHT.
- SUBMITTALS: FIRE ALARM SYSTEM CONTRACTOR SHALL PREPARE AND SUBMIT SHOPS DRAWINGS TO UTAH STATE FIRE MARSHAL'S OFFICE, OWNER AND ENGINEER FOR REVIEW/APPROVAL PRIOR TO ORDERING OR INSTALLING ANY EQUIPMENT. SUBMITTALS SHALL CONFORM TO THE CONSTRUCTION DOCUMENTS REQUIREMENTS OF IFC 907.1.1.
- SYSTEM TYPE: FIRE ALARM SYSTEM SHALL MEET THE REQUIREMENTS FOR PROTECTED PREMISE FIRE ALARM SYSTEMS. SYSTEM SHALL PROVIDE OFF-PREMISE NOTIFICATION OF STATUS TO CENTRAL STATION DETERMINED BY OWNER. PROVIDE A SINGLE FACP FOR ALL 4 BUILDINGS. EXTEND SLC FROM ONE BUILDING TO THE NEXT VIA EXISTING UNDERGROUND CONDUIT (COORDINATE WITH OWNER). TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATIONS. PROVIDE CIRCUIT EXTENDERS/BOOSTERS AS REQUIRED. PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSION ON ALL CIRCUITS WHERE THEY ENTER OR LEAVE A BUILDING.
- OCCUPANT NOTIFICATION: NOTIFICATION CIRCUITS SHALL BE ZONED WITH ONE ZONE PER BUILDING. PROVIDE REMOTE NOTIFICATION POWER SUPPLIES IN EACH BUILDING TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONFIGURE NOTIFICATION CIRCUITS IN EACH BUILDING TO ACTIVATE ONLY UPON RECEIPT OF A WIRING DEVICE IN THAT BUILDING.
- WIRING/CONDUIT: ALL WIRING TO BE FREE OF OPENS, SHORTS AND GROUNDS. INSTALL ALL WIRING IN MINIMUM 1/2" RIGID CONDUIT, EMT, RED MC CONDUIT INSTALLATION SHALL CONFORM TO ALL APPLICABLE REQUIREMENTS OF NFPA 70 AND DFCM STANDARDS. ALL CONDUIT PENETRATIONS THROUGH RATED PARTITIONS SHALL BE FIRE STOPPED WITH A SUITABLE CAULKING COMPOUND. ALL WIRING USED IN THE FIRE ALARM SYSTEM SHALL BE FPL (FIRE POWER LIMITED) WITH 300 V INSULATION OR EQUIVALENT AS PER NFPA 70 ARTICLE 760.
- SMOKE DETECTORS: PROVIDE SMOKE DETECTORS WHERE SHOWN ON PLANS IN ALL CORRIDORS, LOBBIES, ELEVATOR EQUIPMENT ROOM AND ABOVE FIRE ALARM CONTROL EQUIPMENT. MAXIMUM SPACING OF DETECTORS SHALL BE 30' BETWEEN OR 15' FROM FURTHEST WALL.
- MANUAL PULL STATIONS: INSTALL PULL STATIONS AT EACH BUILDING EXIT AS SHOWN ON PLANS. MOUNT PULL STATIONS AT 48" AFF ON RECESSED JUNCTION BOXES.
- HEAT DETECTORS: PROVIDE HEAT DETECTORS WHERE SHOWN ON PLANS IN ELEVATOR EQUIPMENT ROOM AND ELEVATOR PIT. MAXIMUM SPACING FOR HEAT DETECTORS SHALL BE 50' BETWEEN DETECTORS OR 25' FROM FURTHEST WALL.
- ADDRESSABLE MODULES: PROVIDE ADDRESSABLE MODULES WITH EXTERNALLY VISIBLE LED TO MONITOR CONVENTIONAL DEVICES (WATER FLOW SWITCHES, VALVE, TAMPER SWITCHES, ETC.). LOCATE MONITOR MODULE ADJACENT TO FLOW OR TAMPER SWITCH IN AN ACCESSIBLE LOCATION. LABEL AS PART OF THE FIRE ALARM SYSTEM WITH THE NAME OF THE DEVICE. MONITORED ON THE COVER OF THE JUNCTION BOX.
- NOTIFICATION APPLIANCES: PROVIDE AUDIBLE AND VISUAL NOTIFICATION APPLIANCES THROUGHOUT EACH BUILDING IN ACCORDANCE WITH PUBLIC MODE SIGNALING REQUIREMENTS OF NFPA 72. VOLUME OF HORNS AND SPEAKERS SHALL BE SUFFICIENT TO PROVIDE A SOUND LEVEL OF 15 DB ABOVE AMBIENT IN ALL OCCUPIED AREAS. VISIBLE ALARMS SHALL BE PROVIDED THROUGHOUT ALL PUBLIC AREAS OF THE BUILDING AS WELL AS PRIVATE OFFICES AND AREAS WITH POSSIBLE OCCUPANCY BY HEARING IMPAIRED PERSONS. PROVIDE SYNCHRONIZATION OF STROBE FLASHES.
- FIRE SAFETY FUNCTIONS:  
ELEVATOR RECALL: CONTROL MODULES WITH RELAY CONTACTS SHALL BE INSTALLED AND PROGRAMMED TO PROVIDE ELEVATOR RECALL AND ELEVATOR POWER SHUNT TRIP. THE CONTROL RELAY MODULES SHALL BE INSTALLED WITHIN 36" OF DEVICE OR CIRCUIT CONTROLLED. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY NUMBER AND LOCATION OF DEVICES TO BE CONTROLLED.  
FIRE/SMOKE DAMPERS: PROVIDE CONTROL MODULES WITH RELAY CONTACTS TO RELEASE ALL EXISTING FIRE/SMOKE DAMPERS. INSTALL MODULE WITH 36" OF DAMPER OR POWER CIRCUIT TO DAMPER MODULE SHALL BE LISTED FOR VOLTAGE AND CURRENT REQUIRED TO OPERATE DAMPERS. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY NUMBER AND LOCATION OF DAMPERS TO BE CONTROLLED.
- TESTING: SCHEDULE AND PERFORM ALL ACCEPTANCE TESTS REQUIRED BY NFPA 72. TESTING SHALL BE WITNESSED BY UTAH STATE FIRE MARSHAL'S OFFICE, PROJECT ENGINEER, DFCM AND BUILDING MAINTENANCE PERSONNEL. SUBMIT A WRITTEN TESTING PLAN DETAILING EACH TEST TO BE PERFORMED TO EACH AGENCY AT LEAST THREE DAYS PRIOR TO SCHEDULED TEST.
- DEMOLITION: CONTRACTOR SHALL REMOVE EXISTING SYSTEM (CONTROL PANEL, POWER SUPPLY, DETECTORS, WIRING, ETC.) THAT PROVIDES ELEVATOR RECALL FUNCTIONS AND ACTIVATION OF FIRE/SMOKE DAMPERS. ELEVATOR RECALL AND DAMPER ACTUATION TO BE PROVIDED BY NEW FIRE ALARM SYSTEM.

FIRE ALARM SYSTEM KEY NOTES

- FURNISH AND INSTALL NEW ADDRESSABLE FIRE ALARM CONTROL PANEL (FACP) FOR UDOT REGION 3 COMPLEX (4 BUILDINGS). INSTALL FACP IN ADMINISTRATION BUILDING AND EXTEND SIGNALING LINE CIRCUIT BETWEEN BUILDINGS USING EXISTING UNDERGROUND CONDUIT PROVIDED BY OWNER (WIRE BY CONTRACTOR). FACP SHALL BE SILENT KNIGHT 5820 XL OR FIRE-LITE MS-9600 WITH DACT-UD. EXTEND PHONE LINES (PRIMARY AND SECONDARY) FROM EXISTING TELEPHONE TERMINAL BOARD TO FACP TO PROVIDE OFF-PREMISE MONITORING. INSTALL FACP CABINET RECESSED INTO WALL.
- FURNISH AND INSTALL NEW REMOTE ANNUNCIATOR PANEL (KEYPAD) WITH ALPHANUMERIC READ OUT FOR FIRE ALARM SYSTEM. LOCATE ANNUNCIATOR NEAR MAIN ENTRANCE OF ADMINISTRATION BUILDING AS SHOWN ON PLANS. LOCATION OF ANNUNCIATOR PANEL MAY BE ADJUSTED BY CONTRACTOR TO FACILITATE INSTALLATION BUT THE PANEL SHALL BE VISIBLE FROM THE MAIN ENTRANCE DOORS TO THE BUILDING. WALL MOUNT ANNUNCIATOR AT 54" AFF. ANNUNCIATOR SHALL BE MOUNTED ON RECESSED TYPE JUNCTION BOX AND CONDUIT TO BOX SHALL BE CONCEALED IN WALL.
- NEW FIRE SPRINKLER SYSTEM RISER. INSTALL ADDRESSABLE MONITOR MODULE AT EACH WATER FLOW SWITCH AND VALVE SUPERVISORY SWITCH TO FACILITATE MONITORING OF SWITCH AS AN ADDRESSABLE POINT. MONITOR MODULE SHALL MOUNT IN 4" SQUARE JUNCTION BOX AND BE EQUIPPED WITH AN EXTERNAL LED VISIBLE FROM FLOW OR VALVE SUPERVISORY SWITCH. PROGRAM ACTIVATION OF WATER FLOW SWITCH AS AN ALARM SIGNAL AND ACTIVATION OF VALVE SUPERVISORY SWITCH AS A SUPERVISORY SIGNAL.
- EXTEND SIGNALING LINE CIRCUIT(S) (SLC) FROM FACP IN ADMINISTRATION BUILDING TO INITIATING DEVICES AND REMOTE NOTIFICATION CIRCUIT POWER SUPPLIES IN LABORATORY, HEAVY EQUIPMENT/PAINT STORAGE AND WAREHOUSE/SHOP BUILDINGS. INSTALL SLC IN EXISTING BURIED CONDUITS THAT RUN BETWEEN ELECTRICAL ROOM IN EACH BUILDING AND UNDERGROUND VAULT LOCATED BETWEEN ADMINISTRATION AND LABORATORY BUILDING (SEE SHEET FP-11). PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSORS IN ACCORDANCE WITH NFPA 70 ARTICLE 285 ON SLC AT EACH POINT THAT THE CIRCUIT ENTERS OR EXITS A BUILDING. TOTAL LENGTH OF SLC SHALL NOT EXCEED MANUFACTURER RECOMMENDATIONS. PROVIDE ADDITIONAL SLC CIRCUITS OR CIRCUIT EXTENDER/REPEATER AS REQUIRED. CABLE INSTALLED IN BURIED CONDUITS SHALL BE SUITABLE FOR INSTALLATION SUBMERGED IN WATER.
- FURNISH AND INSTALL A REMOTE POWER SUPPLY TO POWER NOTIFICATION APPLIANCE CIRCUITS (NAC) FOR THE LABORATORY, HEAVY EQUIPMENT/PAINT STORAGE AND WAREHOUSE/SHOP BUILDINGS. PROVIDE AN ADDRESSABLE RELAY MODULE TO ACTIVATE NAC CIRCUITS UPON OPERATION OF INITIATING DEVICES IN THAT BUILDING ONLY. PROVIDE AN ADDRESSABLE MONITOR MODULE TO SUPERVISE TROUBLE CONTACTS OF REMOTE POWER SUPPLY. INSTALL BATTERIES TO PROVIDE SECONDARY POWER SUPPLY FOR 24 HOURS IN STANDBY AND 5 MINUTES IN ALARM. LAYOUT OF NAC CIRCUITS SHALL LIMIT VOLTAGE DROP BETWEEN POWER SUPPLY AND MOST REMOTE APPLIANCE TO LESS THAN 20V. PROVIDE MODULES AS REQUIRED TO SYNCHRONIZE STROBE FLASHES OF ALL NOTIFICATION APPLIANCES WITHIN A SINGLE FIELD OF VIEW. LOCATION OF REMOTE POWER SUPPLY MAY BE ADJUSTED IN FIELD AS REQUIRED TO COORDINATE WITH EXISTING BUILDING SYSTEMS AND EQUIPMENT.
- FURNISH AND INSTALL SMOKE DETECTORS AT EACH ELEVATOR LOBBY AND IN THE ELEVATOR EQUIPMENT ROOM TO PROVIDE ELEVATOR RECALL FUNCTIONS IN ACCORDANCE WITH NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAYS TO INTERFACE WITH ELEVATOR CONTROLS AND PROGRAM RECALL FUNCTIONS AS FOLLOWS:  
1. OPERATION OF SMOKE DETECTOR 2ND FLOOR LOBBY AND ELEVATOR EQUIPMENT ROOM - ELEVATOR RECALL TO 1ST FLOOR  
2. OPERATION OF SMOKE DETECTOR 1ST FLOOR LOBBY - ELEVATOR RECALL TO 2ND FLOOR. CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL HEAT DETECTORS ADJACENT TO FIRE SPRINKLERS IN ELEVATOR PIT AND ELEVATOR MACHINE ROOM. HEAT DETECTORS SHALL CONFORM TO NFPA 72 AND ASME A17.1. PROVIDE ADDRESSABLE RELAY AND SHUNT TRIP BREAKER TO DISCONNECT POWER TO ELEVATOR EQUIPMENT UPON OPERATION OF EITHER HEAT DETECTOR. CONTRACTOR SHALL INCLUDE COST OF COORDINATION EFFORT (SERVICE CALLS) WITH ELEVATOR SERVICE CONTRACTOR IN BID.
- FURNISH AND INSTALL ADDRESSABLE RELAY TO PROVIDE ACTUATION OF FIRE/SMOKE DAMPERS. RELAY SHALL BE NORMALLY ENERGIZED AND RATED FOR VOLTAGE AND CURRENT REQUIRED FOR DAMPER ACTUATION.
- PROVIDE PROGRAMMABLE RELAY TO RELEASE EXISTING DOOR HOLD-OPEN DEVICES ON EXISTING FIRE DOORS. RELAY SHALL RELEASE DOORS UPON RECEIPT OF ANY FIRE ALARM SIGNAL AT FACP. POWER TO DOOR HOLD-OPEN DEVICES SHALL BE PROVIDED BY FACP.

FIRE ALARM EQUIPMENT LEGEND

DEVICE	DESCRIPTION	MOUNTING	REMARKS
FACP	FIRE ALARM CONTROL PANEL	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	SILENT KNIGHT MODEL 5820XL OR FIRE-LITE MODEL MS-9600 WITH DACT-UD
ANN	FIRE ALARM ANNUNCIATOR PANEL	WALL MOUNT ON RECESSED J-BOX AT 54" AFF	KEY PAD WITH ALPHANUMERIC (MINIMUM 80 CHARACTERS) WITH INPUT KEYS TO ALLOW SYSTEM RESET AND ALARM SILENCE
NAC-PS	REMOTE POWER SUPPLIES FOR NOTIFICATION APPLIANCE CIRCUITS	SURFACE MOUNT ON WALL WITH CENTER OF PANEL AT 54" AFF.	TO POWER NOTIFICATION APPLIANCE CIRCUITS. CONTROLLED BY ADDRESSABLE RELAY ON SIGNALING LINE CIRCUIT
⊙	ADDRESSABLE SMOKE DETECTOR	CEILING MOUNT ON RECESSED J-BOX.	INSTALL ON CEILING IN ALL CORRIDORS, LOBBIES AND ABOVE FIRE ALARM CONTROL EQUIPMENT AS INDICATED ON PLANS.
⊕	ADDRESSABLE HEAT DETECTOR	SURFACE MOUNT ON J-BOX WITHIN 24" OF FIRE SPRINKLER	TO PROVIDE POWER DISCONNECT TO ELEVATOR PRIOR TO OPERATION OF ADJACENT SPRINKLER
■	ADDRESSABLE PULL STATION	WALL MOUNT AT 48" AFF ON RECESSED J-BOX NEAR CONVENTIONAL DEVICE TO BE MONITORED.	INSTALL AT EACH EXIT DOOR AS INDICATED ON PLANS
Ⓜ	ADDRESSABLE MONITOR MODULE	MOUNT ON 4-SQUARE J-BOX NEAR CONVENTIONAL DEVICE TO BE MONITORED.	TO FACILITATE MONITORING OF CONTACTS OF CONVENTIONAL INITIATING DEVICES AS AN ADDRESSABLE POINT
ⓐ	ADDRESSABLE CONTROL MODULE	MOUNT ON 4-SQUARE J-BOX WITHIN 3" OF DEVICE OR CIRCUIT CONTROLLED	FOR PROTECTED PREMISE FIRE SAFETY FUNCTIONS (ELEVATOR RECALL AND NAC ACTIVATION)
◇	WATER FLOW SWITCH	FIRE SPRINKLER RISER	TO DETECT WATER FLOW IN FIRE SPRINKLER SYSTEM
⋈	VALVE SUPERVISORY SWITCH	FIRE SPRINKLER CONTROL VALVES	TO MONITOR POSITION OF CONTROL VALVES
✕	FIRE ALARM STROBE	WALL MOUNT AT 80" AFF OR CEILING MOUNT ON RECESSED J-BOX	STROBE SHALL HAVE A MINIMUM CANDELA RATING OF 150cd INTENSITY SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW
⚡	FIRE ALARM HORN/STROBE (WALL)	WALL MOUNT AT 80" AFF ON RECESSED J-BOX	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
⚡	FIRE ALARM HORN/STROBE (CEILING)	CEILING MOUNTED ON RECESSED J-BOX	CANDELA RATING FOR STROBE AS INDICATED ON DRAWINGS. SYNCHRONIZE WITH ALL OTHER STROBES IN VIEW. SET HORN VOLUME TO MAXIMUM LEVEL.
🔊	EXTERIOR FIRE ALARM HORN	WALL MOUNT AT 10'-0" AFF ON WEATHER PROOF BACK BOX	EXTERIOR ALARM. SET HORN VOLUME TO MAXIMUM LEVEL.
ⓐ	FIRE/SMOKE DAMPER	EXISTING	PROVIDE ADDRESSABLE MODULE FOR CONTROL.
ⓐ	MAGNETIC CONTACT DOOR HOLDER	EXISTING	PROVIDE CONTINUOUS 24 VDC POWER FROM FACP TO DOOR HOLDER. PROVIDE CONTROL MODULE AND PROGRAM TO DISCONNECT POWER AND RELEASE DOORS UPON RECEIPT OF FIRE ALARM SIGNAL.

UDOT REGION 3  
PROVO, UTAH

FIRE ALARM SYSTEM UPGRADES  
DFCM PROJECT #05233900

FIRE ALARM  
SYSTEM PLAN  
ADMINISTRATION  
BUILDING LEVEL 1  
FP-3.1

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